The Builder.

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Old and New Sarum.

CLOSE to the spot where the wild and desolate undulations of Salisbury Plain terminate on the south through the junction of the river Avon and its tributary, the Wily, stands conspicuous a steep hill, almost detached from the high ground of which it is a projecting spur. By nature it is adapted to be a fortress of a primitive race. By primitive races it was made a fortress. Perhaps the Britons were the first to occupy it. They were assuredly followed by the Romans. After them came the Saxons; in course of time it was stormed and held by the Danes. Gradually, as more permanent means of fortification were adopted, it became the seat of a city and castle, which, under the name of Old Sarum, has filled archæologists and historians with interest, and has excited the derision of every post-Reform politician.

Imagine a space of ground, somewhat larger than Kennington Oval, forming a tolerably level summit to this steep hill. Just where this miniature table-land begins its abrupt descent to the valley on every side, imagine a huge circumscribing ditch, deeper and wider than the moat of many a castle; rising from the midst of the table-land picture another steep mound, also surrounded with a tremendous ditch; clothe the ditches with shrubs and trees; fringe the edges of the escarpments with bushes; scatter a plentiful sprinkling of flints over the ploughed surface of the main platform; leave the summit of the central mound undulating and grassy; and you have the present aspect of Old Sarum. The ditches are the remarkable part; their width, their depth,—if strength depends upon such qualities,—must have rendered the place almost impregnable. It is said that we owe them to the Saxons, not improbably to Alfred the Great. Certainly later comers made use of them when the city began to arise, and they were rendered still more secure by the erection of a flint wall on the inner edge. One little fragment of this still remains, as devoid of detail and as much like concrete as the fragments of the abbey at Bury St. Edmunds. Thus strongly defended, lying at the junction of several important roads, and in the heart of a country the theatre of the principal events recorded in the early history of the island, Old Sarum became one of the most important towns in the kingdom. The city grew till it filled the whole of the little plateau. Further than this it could not extend, for there was the huge fosse, and beyond it a violent descent into the valley. On the central mound stood the castle, dominating the whole town; sloping away from it were thickly clustered houses, all ending abruptly at the wall and fosse. Perched thus on the summit of the steep hill, Old Sarum must have looked very much like the little cities which figure in the backgrounds of Albert Dürer's pictures, only the tapering spires would be wanting, and the general appearance would be sterner, straighter, and more sombre than that of the later German cities. Beneath the walls of the city, in the plains where Salisbury now stands, William the Conqueror held a review of his victorious forces four years after the great battle of Hastings. Two years later than this the city was further distinguished by the removal to it of the episcopal see, which hitherto had been at Sherborne, in Dorsetshire, and presently a splendid cathedral was commenced. After fifteen years of labour it was finished and consecrated in 1092, in the reign of William the Red, and was worthy to be compared with any of the numerous cathedrals and abbey churches which were then rising throughout the land.

The city was now complete. It had its castle, its cathedral, and bishop's palace, its miniature streets of grim houses thrusting themselves up to its grimmer walls. Man had done his best; but Nature was against him. The stars in their courses fought against Old Sarum. The place was bleak. It was exposed to every wind of Heaven. The rude north wind, after racing across the petrified billows of Salisbury Plain, burst in fury against the lofty city. Its elevated situation made it the sport of every tempest, and only five days after the cathedral was consecrated a thunderstorm destroyed the roof of the tower, and damaged the walls. The soil was unkindly, and refused to produce much besides flint. There was very little water, and what there was could only be obtained at a high price. A canon of Salisbury, Peter of Blois, who lived in those days, records the absence of water and the abundance of flints. "The wind rages there," he also says, "but the nightingale is silent."

"Sævit ibi ventus, sed Philomela silet."

All this might have been borne had the city not been divided against itself, but the union of Church and State bred quarrels. All was well so long as the bishop of the cathedral was also castellan, but when the constableship of the castle was given to a layman jealousies arose. Perhaps a dissolute soldiery chafed at the constant reproach implied by the blameless life of the monks; perhaps the erring priests saw in the soldiers a tacit condemnation of their own evil courses. But whichever way it was, the secular arm was the stronger, and on one occasion asserted itself in a very aggressive manner. The clergy, in accordance with their regulations, wound solemnly down the hill one winter's day to visit a church somewhere in the valley. The soldiers seeing the whole mass of them fairly outside the gates for at least an hour or two, boldly resolved that they should stay out a good deal longer than they expected. When the monks returned they found the gates closed, and, amid the fierce blasts of a long winter's night, they had to divert themselves as best they could. It must have been excessively aggravating. A solemn procession in winter is but a cold affair; and not all the awe of an ignorant peasantry would be able to compensate for the absence of a good warm fireside. But when, instead of the reverential salutes of the good country people, they were met by the rude taunts of an irreverent and unbelieving soldiery, and the unyielding exterior of their own iron-bound doors, their exasperation must have been complete. If this was to live on a hill, "in God's name," as Peter of Blois said, "let us descend into the level." We can picture good Bishop Poore gazing from a terrace of his exalted palace across the broad valley in search of some place where his monks might be free from the intolerable arrogance of the soldiers. Undoubtedly the most suitable place was away there where the Avon received its tributaries, for already those fair meadows had become the home of many men from the little city whose bounds it was impossible to extend. Some people say the precise spot for the contemplated cathedral was revealed to the Bishop by the Blessed Virgin herself in a dream; others that a bow was drawn at a venture from the castle walls, and that the place where the arrow fell was chosen. But not the strongest of all the tormentors of the monks could have shot an arrow from Old Sarum to the new cathedral, even though burning with the desire to shoot his reverend companions as far away as a man might.

Be this as it may, on the 28th of April, 1220, 128 years after the consecration of the large cathedral on the hill, the first stones of the new and larger cathedral were laid near the river by Bishop Poore, and in a space of forty years the whole pile arose, much as we see it now, to the level of the top of the roof. The growth of the town kept pace with that of the cathedral. In the seventh year of the building Henry III. granted a charter, making the new town a free city. Seventeen years later the great west road, the Icknield-street, was diverted from Old Sarum to the new Salisbury. From that time the elder place declined. It gradually became deserted, its walls fell to ruins; its

cathedral was taken down in 1331, after a life of some 240 years, and went towards the finishing of the new building at Salisbury; and by the time of Leland, who wrote about the period of the Dissolution of the Monasteries in Henry VIII.'s reign, "not one house, neither within or without Old Saresbyri," was inhabited. Much notable ruinous building of the castle remained, and the ditch struck him as "a very deepe and strong thynge," but the place was dead and half-buried. Since then the work of destruction has been going on; the "notable ruinous building" has entirely disappeared save for the scrap of walling already mentioned; and the terrible fosses, those "deepe and strong thynges" which frightened good Mr. Pepys in the dark, afford perennial pleasure to children going a blackberrying; and, if any one wishes to realise what a task it would have been to take the place by assault with heavily-armed men, let him scramble up the sides in his mean nineteenth-century dress.

Splendid as was the cathedral of Old Sarum, it must have been far inferior to that which we see to-day. Its site was wild, weird, and picturesque, but in a forbidding fashion; magnificent no doubt it was, but heavy and sombre, with small windows and huge piers, remarkable, considering the age in which it was built, but what a fierce age it was built in! The younger cathedral was the outcome of greater knowledge and increased refinement. Clustered shafts replaced the cylindrical columns of the nave; graceful triplets superseded the old bare circular-headed windows; clean, delicate vaulting ribs leaped from pillar to pillar, instead of the cumbrous framework of the Normans; and in course of time the wonderful spire soared up 400 ft. above the placid level of the Close. As a specimen of a splendid phase of English architecture Salisbury Cathedral is unique. It has all the virtues and shortcomings of that which we aptly call Early English. No style has ever expressed its purpose in fewer lines than Early English. Its utterances are all simple, direct, innocent, yet sometimes crude, like those of an intelligent child not yet self-conscious. In design, so long as everything is straightforward, nothing can be more satisfactory; but how when there comes a difficult little corner? Take the east window of the choir at Salisbury. To pretend that the early masters, with their broken-backed arches, have coped with the problem as successfully as they would have done had they lived in the Perpendicular era, is to do violence to the meaning of language. But in the graceful simplicity of their nave arcades and vaulting, they far surpass the pedantic, symbolical, bebossed work of their successors. The nave at Winchester, save for the colour, is not to compare with Salisbury. It is in colour that Salisbury loses so much; the bare clean walls, and the windows innocent of all brilliancy, give it a cold air, which a rather scanty congregation does not tend to dispel.

One of the abiding wonders of Salisbury is its spire, 30 ft. higher than the cross of St. Paul's. It is not everywhere that this enormous height tells. Seen from the close, and carrying the eye up from precipice to precipice, till the smooth slope of the spire itself terminates in the cornice of the ironwork at the summit, the effect is most impressive. So, too, is the view from parts of Salisbury Plain, where the spire is seen shooting up from a hollow, which engulphs every vestige of the town and the body of the cathedral. Every one praises this marvellous work, but does every one who speaks of it with undiluted commendation really mean that he absolutely approves of the way in which the springing of the spire from the tower is masked by the pinnacles? Not as a matter of principle, but as a question of graceful contour? Is it not possible that many of the verdicts about particular architectural features here and elsewhere are the result of rather antiquated classification, like that, for instance, which, without appeal, points out the monument of Giles de Bridport as the finest in the cathedral? This verdict clearly was given in the palmiest days of the Gothic revival, and would find many cavillers in these days of renascent Renaissance.

More than 200 years ago visitors were treated to a set story, as they are now, although no architectural theories had then been broached. Does not the following note, still visible in faded ink on the fly-leaf of a certain seventeenth-century "Concordancie of Yeares," and written by an occasional visitor to the cathedral, smack strongly of the verger:—

"Our Ladey Church in Salisbury was built by 3 bishopes; the ferst was bushop poore, hee built 11 yeares; the sekond bushop Bingham, hee built 20 yeares; the 3 was bushop yorke and built aleven yeares; itt was a biulding 42 yeares & have ben built 4 hundred yeares in the yeare 1662. Itt have as many Chapells in itt as mounths, as many doors as weeks, & as many windoes as dayes in a yeare, and as many marbell pillors as howers in a yeare. The lenth of this Church is on hundred 48 yards long and soe is the steepel; and the 22 of september 1662 thare was 2 men at the tope of him and did rost a shoulder of mutton. The prince of denmarke wa' theare then."

The only man who is now allowed to climb this dizzy height, the last few yards of which have to be surmounted by an external ladder, is the man who oils the vane; but there is no record that he cares, on his annual expedition, to stay and roast a shoulder of mutton there, either with the countenance of the Prince of Denmark or without.

Few, if any, of the English cathedrals can vie with Salisbury in the beauty of its Close. The great extent of the smooth sward from which the cathedral springs abruptly, like the mountains from the Lake of Lucerne; the ancient trees whose shadows sparkle, on a sunny day, with every passing breath; the liquid music of the rooks; the screen of ancient houses which completely surround it and shut out the busy, profane world; all these combine to form an ideal picture of dignified, placid content. Here the noise of the "madding crowd's ignoble strife" falls faint and musical, blended with the happy gurgle of the rooks or the distant peal of the organ. Not often is the stillness broken save by the denizens of the place. Perhaps twice on Sundays it is enlivened by a stream from outside its gates, called thither by devotion or its frequent substitute, the love of seeing and being seen. But the tide ebbs as quickly and completely as it flowed, and the Close returns to its normal state of repose. Ah! could one but cast away doubts and difficulties, fling the consideration of problems to the winds, refuse to listen to the dry voice of logic, accept the belief that what is is right, and take up one's abode in Salisbury Close as a calm contented member of the Chapter! How could not one study architecture then,—the architecture of delightful books and white-handed *dilettanti*,—free from the miseries of disputed accounts, scamped work, and the untuneful chorus of committees!

THE ÆSTHETIC ANALYSIS OF CURVES OF CONTRARY-FLEXURE.

BY W. CAVE THOMAS.

I HAVE taken the above theme for a casual exposition of an æsthetic analysis based upon the quantitative or mathematical theory of taste. The curve of contrary-flexure, alternation, or undulation is one very widely obtaining in the fluctuation of nature from one state to an opposite. It is the curve of easy transition. The curve has its analogues in the graduation of colour, light and shade, and music. It is even by a curve of this kind that trains are smoothly transferred from one line of metals to another.

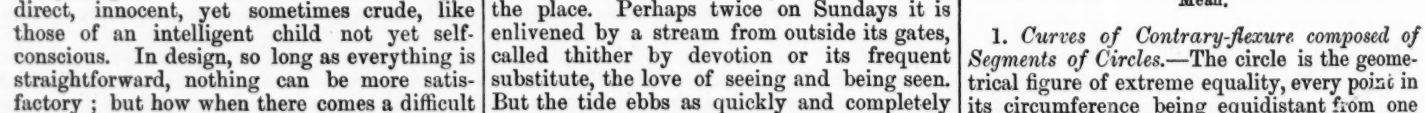
Hogarth never got to the top of the notion of which his line of beauty was a vague *aperçu*. That line, as he conceived it, was constituted of two equal but reversed curves, and was, in the absence of moderate contrariety in its proportions, in no strict sense a line of beauty. The more beautiful curves of contrary-flexure are those in which the two curves are moderately differentiated in magnitude, and in character; those in which a long obtuse curve alternates with a short acute, and *vice versâ*. This is the type of the cyma.

Dilettanti writers are very apt to affirm that there is no equality in nature. Nature, nevertheless, refutes them; she exhibits equality as well as inequality,—she gives us equal as well as unequal days and nights,—equal as well as unequal divisions in the human frame, and regular as well as irregular geometrical figures. Still, it may be admitted that equality is not her general tenour. She avoids extremes, and steers a middle course, between the polar opposites of parity and extreme difference.

Equality and greatest difference are the extremes of quantitative relation, of ratio, and may be expressed as 1 : 1 and 0 : 1. Between these polar extremes nature generally oscillates, seldom deviating, but within the limits of moderation, from her golden mean. This, which is the principle of rectitude in nature, should also be the principle of taste. It was long since regarded as the principle of morals by Aristotle, and modern writers on this subject are beginning to see that right conduct is proportioned conduct. We may go a step further, and show that correct taste is proportioned taste. Dufresnoy must have felt this when he wrote,—

"And taste, like morals, loves the golden mean."

Perfect taste alike rejects the extreme of equality and of inequality in the quantitative constitution of objects designed solely for its gratification. The limits of moderate variation of ratio are 1 : 3 and 2 : 3; 1 : 3 represents moderate divergence or inequality between two quantities, and 2 : 3 (1 : 1½) the moderate approximation of two quantities to likeness, sameness, or equality. The ratio of absolute indifference or neutrality between the extremes of quantitative relation is expressed by the mean ratio 1 : 2. It is this ratio of which alone it cannot be said that the relation between its two terms is either too equal or too different. The following is the skeleton scale of the infinite series of ratios:—



1. *Curves of Contrary-flexure composed of Segments of Circles.*—The circle is the geometrical figure of extreme equality, every point in its circumference being equidistant from one within. And its curve is the curve of extreme grossness to sense. The cultivated sense alike revolting from excess and defect, the too much and the too little, finds its concords in "the moderate." For these reasons the circle is not found to obtain to any great extent in works of consummate taste, for the circle and sphere are too equal, too constant in curvature, and too redundant in mass and contour. The circle, however, occurs in the horizontal sections of works of nature and of art. In works of art the circular in plan is mitigated in perspective and appears elliptical. Curves of contrary-flexure composed of segments of circles are, therefore, seldom found in artistic design; that composed of two semicircles is perhaps the most disagreeable of its genus. A curve of contrary flexure of two flatter segments, or of arcs of 90 deg., is far preferable, and is very much the proportion of Hogarth's line; but both the foregoing combinations contain too great an amount of equality or regularity in their curvature and their alternation. A much more agreeable line than either is that which is composed of two unequal segments whose chords, and whose arcs, are in the mean ratio of 1 : 2, and of such there may be two modes, *i.e.*, one in which the longer chord carries the obtuser segment, and the other in which it carries the acuter. In these combinations an element of moderate contrariety is introduced which æsthetically improves them.

2. *Curves of Contrary-flexure produced by Combinations of the Ellipse.*—The next series of curves of contrary-flexure and of æsthetic superiority, as it would naturally be supposed, would be combinations of the ellipse. And, just as æsthetically the ellipse supersedes the circle, in sensuous appositeness, by the greater amount of inequality or differentiation in its curve, we should expect elliptical curves of contrary-flexure to supersede those of the

circle. This they do under certain conditions, but not combined as are combined semicircles, as the junction of the two acuter portions of the curve causes a disagreeable break in the line; but, if the alternation be effected earlier in the curve and in the proportions of the former series, we obtain a very pleasing set of curves.

3. *Curves of Contrary-flexure produced by the Combination of a Segment of an Ellipse with a Segment of a Circle.*—If these combinations be followed out on the system we have indicated we also get a series of agreeable "composite" curves.

4. *Curves of Contrary-flexure produced by Combinations of the Oviform.*—The oviform may be regarded as a curvilinear figure generated from three foci. The Greeks were probably acquainted with the æsthetic pre-eminence of the oviform. The study of the reasons of this pre-eminence and the limits of its differentiation will possibly clear up much that is now obscure in Grecian architecture. The oviform may be divided into two classes,—the upright and the oblate. The ellipse, though more agreeable to taste than the circle, is less so than the oviform, for it still possesses too large an element of equality and of constancy in its curve. The oviform is that moderated combination of balance and variety which is in perfect accord with the cultivated taste. It furnishes the most beautiful vase forms and bowl forms, as it does also curves of contrary-flexure and the echini; but with curves of contrary-flexure composed of the oviform, as with those composed of the ellipse, we have to choose a point of junction in which the curves of contrary flexure may pass the one into the other without any shock to the continuity of the line. Of this series we have first a curve of the alternation of vase curves, in which the curves are similar but of different magnitudes, the contrast being in magnitude only. In the second, two vase forms of moderately different proportions are combined. In the third, a combination of two similar oblate oviforms of moderately different magnitudes: and fourth, a curve of contrary flexure, in which two oblate oviforms of moderately different proportions are combined.*

To draw all these curves geometrically would occupy considerable time; but, if we draw three right lines and cut them in the three principal moderate ratios of 2 : 3 (1 : $1\frac{1}{2}$), 1 : 2, and 1 : 3, the educated eye can, by bearing in mind the different characteristics of the curves of the several series described, draw lines of beauty, of contrary-flexure, passing through those nodal points without the aid of mathematical instruments.

It may have been noticed that in Mr. Penrose's lecture on Grecian architecture the following ratios were given as those most affected by the Greeks; but it should be borne in mind that these have to be reduced to represent those quantitative relations as they appear to the optic sense, which estimates the relation of two magnitudes to each other, simply, whilst the ear notes the relation of a certain number of vibrations to some other number. The first series given, "$\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6} \ldots . \frac{9}{10}$," are not regarded by the eye as magnitudes having a "difference of unity," but as 1 : 2, 1 : $1\frac{1}{2}$, 1 : $1\frac{1}{3}$, 1 : $1\frac{1}{4}$, 1 : $1\frac{1}{5}$, ... 1 : $1\frac{1}{9}$," and the second series, "$\frac{1}{6}, \frac{2}{7}, \frac{3}{8}, \frac{4}{9}, \frac{5}{10}, \frac{6}{11}, \frac{7}{12}$," not as differing by 5, but as 1 : 6, 1 : $3\frac{1}{2}$, 1 : $2\frac{2}{3}$, 1 : $2\frac{1}{4}$, 1 : 2, 1 : $1\frac{5}{6}$, 1 : $1\frac{5}{7}$. The 5 : 10 of the second series is obviously the same ratio as 1 : 2 of the first. But why should these ratios have been selected?

The Conversazione of the President of the Institution of Civil Engineers will be held on Friday, June 5th, from nine to twelve p.m., at the Inventions Exhibition, when, with the exception of the Royal Albert Hall, all the entrances to the Exhibition will be open. The reception will be near to the main entrance. Having regard to the fact that a visit to the gardens will probably involve the use of hats, coats, or cloaks, provision will not be made for taking care of them.

* There may be other curves of contrary-flexure than those enumerated, but there are none more apposite to taste than that of the oviform.

RESTORATION OR REPAIR?

THE critical spirit, with reference to architecture, is but rarely and feebly manifested in this country among the unprofessional public. Most persons of average intelligence do not hesitate to pass judgment upon a poem, a play, or a picture, or at least to convey some notion of the impression, pleasurable or otherwise, which they have derived from it; and while they do not pretend to exercise the discrimination of trained experts, they often assert that they "know when they are pleased." Perhaps there is no art which occupies a position so exceptional in this respect as architecture. The average Englishman pronounces no opinion upon its specimens, not because, as in other arts, he cannot tell why he is pleased, but rather because he does not know whether he really is pleased or not. It cannot be doubted that this indifference to the merits or demerits of modern work proceeds, in the main, from ignorance. Our average Englishmen admires the architecture of the past, chiefly because he has been taught to admire it; just as he has been taught to regard Homer as a great poet, although he may never have read a single line of his writings. But such exclusive admiration for the architecture of the past on the part of superficial observers arises in some degree from a prevailing disposition to magnify the importance of all artistic works of bygone times. The works of modern art are plentiful enough: good, bad, and indifferent, we see them growing up around us every hour; they appear common to us, and their excellence is often underrated; but there is a rarity about old work that sometimes causes it to be invested with an undeserved halo of sanctity. Whatever is old is thought to be good, and the spirit of archæological conservatism thus operates in discouraging all attempts at artistic discrimination.

We shall not, of course, be supposed to undervalue the excellence of those triumphs of art which our forefathers have bequeathed to us. The architecture of the Pointed styles in England, besides its magnificent artistic worth, possesses the merit of being distinctively national in its character; but the time is gone by when our architects should submit to be bound down to servile imitations of examples, however admirable in themselves. Some of their work displays all the evidences of a vigorous individuality, and deserves to take rank as accurately representing the spirit of the age. Such being the case, it may be asked, what course of action are they to adopt towards the venerable relics of Mediæval architecture committed to their care, often in a half-ruined condition? Are they to approach them as architects, to whom the duty of restoration may be confidently entrusted; or as builders, called in merely for the purpose of executing necessary repairs?

It is strange that the voice of criticism, usually silent, or but faintly heard, either in praise or condemnation of modern work, should suddenly become so clamorous when any restoration of old work is contemplated. Those who do not know or do not care what is done in their own day, seem quite capable of appreciating what was done in former times and under totally different surroundings than those in which they live; and if any architect dares to propose doing more than merely to introduce a tie here or a prop there to arrest the progress of decay in an ancient structure, there arises, from the self-constituted guardians of Mediæval remains, such a howl of "Hands off!" that he might feel terrified if he were not inclined to laugh. It really seems somewhat unreasonable that the cry of vandalism and desecration should be raised now that our old Gothic churches have passed out of the hands of the churchwarden and the village carpenter, who made such havoc with them in the last century and in the early part of this. They are now committed to the care of a skilled professional body, whose qualifications ought, indeed, to inspire general confidence. But this is not enough. Restoration of any kind, whether competent or incompetent, is denounced as a species of sacrilege, and the architect is told that he must confine himself to the merest structural repairs, or else be stigmatised as wanting in due reverence for the sacred works of the past.

Perhaps it would not be unprofitable if the opponents of restoration were to ask themselves seriously, what they really mean by a reverence for the works of the past. Do they mean a desire to give effect, as far as possible, to the original intentions of the founders, by the continued use of these buildings for the purposes for which they have been designed; or do they simply mean a wish to save them from the ravages of time, as interesting specimens of what the churches and cathedrals of England once were, like objects preserved in a museum for the inspection of the curious? We say churches and cathedrals, because, for reasons unnecessary to pursue here, it happens that the most important specimens of Mediæval architecture that remain to us are temples of worship, and the secular buildings are so comparatively few that it is hardly necessary to refer to them. These churches and cathedrals, then, some of which are partially in ruins, shall they be rendered fit for use? Shall we build new aisles, porches, or other adjuncts where the old have disappeared? Shall we restore the broken mullions and tracery, inserting new stones where requisite, and replace the old glass, that has long been lost, with new? If so, then, when the work of restoration is completed, a flock of worshippers may once more assemble within those ancient walls, and the voices of a choir may again be heard reverberating through the chancel where silence has reigned for so long. Or shall we, on the other hand, keep these buildings as they are, patching them up here and there sufficiently to prevent them from collapsing altogether, but never attempting to restore those portions that have wholly or partly disappeared? Shall we leave the picturesque outline of the semi-ruin as it is, refraining from the addition of new porches or aisles, and forbearing to fill in the chasms in its walls with new traceried windows and glazing of modern design, on the principle that it is unwise to put a piece of new cloth into an old garment? Then, if the congregation cannot use the church, let them build a new one elsewhere. Never mind the sentimental feeling of attachment that endears them to the same old place of worship which has done duty for centuries; only let us keep our ruins, our great national archæological curiosities, undisturbed.

Before committing ourselves to either of these courses of action, it might be well to inquire, which of them has been adopted by the architects of the past. Surely those who profess to have so great an admiration for their works, will not deny that the great masters who have gone before would have been most likely to form correct views upon the question of restoration. Upon examining their works, then, what do we find? Scarcely a church, and certainly not a cathedral in England, that does not contain important additions made to it at different periods of history. Chapels were added from time to time, as they were wanted, spires were built that had never been contemplated by the original architects, and carving was introduced into parts of a building that had been intended to be left perfectly plain. Buildings were sometimes greatly improved by these additions and alterations, and sometimes the reverse; but those who made them were actuated by no feeling of disrespect towards their predecessors, but with every desire to serve the same ends; they strove to do honour to their work for its own sake as well as for the sake of the objects for which it had been commenced. Modern architects ought, we think, to have no hesitation in contributing their share to the labours that have, for successive periods, maintained our sacred edifices in healthy preservation. There need be no hyprocrisy about restoration. We may refrain from destroying the unity of a fine building by the introduction of features totally at variance with the harmony of its existing parts, and we may, at the same time, avoid manufacturing specimens of sham antiquity. A restored church does not pretend to be

entirely old or entirely new ; a piece of patchwork it may be called ; but then all our old churches have been pieces of patchwork for centuries, and must continue to be so unless posterity is to be deprived of them altogether.

NOTES.

DISCOVERIES as to the ancient topography of Pergamos go on apace. Dr. R. Bohn thinks he has fixed the site of the Temple of Dionysos. Dio Cassius, who was himself at Pergamos, mentions a Dionysion (Dio Cass., xli., 61), and Cæsar ("De Bell. Civ.," iii., 105) speaks of the adyta of the same temple. A theatre has been laid bare at Pergamos, and an inscription settles that it was dedicated to Dionysos, the leader (*καθηγεμών*). There is no space for a temple close to the theatre, so Dr. Bohn looks a little further afield. On the lower market-place, close to the west wall, the foundations of an oblong building, unmistakeably a temple, have been excavated. Happily what that temple is is placed almost beyond doubt by the discovery of architectural and sculptured remains built into a neighbouring Byzantine wall. From these it appears that the temple was a Doric prostylos, presenting certain peculiarities, which Dr. Bohn shows in detail in his reconstruction. The waterspouts of the cornice are sculptured very appropriately into satyr heads, unmistakable from their long pointed ears. A marble slab has also been found, decorated with somewhat naturalistic designs of vine branches with leaves and fruit. Dr. Bohn conjectures that this formed part of the frieze of the inner cella. His paper on the subject was read before the last meeting of the Königl. Preuss. Akademie, at Berlin, and is now published as a *tirage à part* from the Abhandlungen of the Society.

AMERICA, with its slender archæological resources, yet ventures to put forth a periodical devoted exclusively to the promotion of archæological study. The "American Journal of Archæology and of the History of the Fine Arts," the first number of which has just appeared, covers a wide field,—antiquities, Oriental, Classical, Early Christian, Mediæval, and American. The journal undertakes not only to notice and illustrate important works contained in public museums and private collections, but also to record and review the whole field of archæological discovery and investigation, and to furnish reports of meetings, summaries of papers, reviews of books, &c. We are glad to see there are nine editors, two general and seven special ; we think they will have enough to do. England is represented by Dr. Waldstein. The journal is to appear four times yearly. The first number, which may be supposed to be fairly representative, contains a paper on J. J. Middleton, whose only interest is, we suppose, that he was apparently the first American archæologist (we hope the paper will not lapse into mere antiquarianism) ; a discussion by Dr. Waldstein of the central slab of the Parthenon frieze ; an account of some inscribed sepulchral vases in possession of M. Feuardent, of New York, by A. C. Merriam ; an article on the revival of sculpture in Europe in the thirteenth century ; and a paper by A. R. Marsh, which is in fact an analysis of Dr. Dörpfeld's *mémoire* on ancient brick construction and its influence on Doric style, which we noticed in detail six months ago.

THE Lillebonne mosaic is to be put up to auction at the Hôtel Drouot, Paris, and will go no one knows whither. M. E. Babélon does, therefore, good service to archæology by securing, if not the safety of the original, at least, a careful reproduction in the *Gazette Archéologique*, the current number. The mosaic was found at Lillebonne, near Havre, and belongs to a class necessarily rare, *i.e.*, monuments of Roman workmanship found within the limits of ancient Gaul. The few mosaics with pictorial, as opposed to merely decorative subjects found in France, have too often suffered destruction from their inconvenient size. The centre of the Lillebonne mosaic represents Apollo pursuing Daphne ; the lower part of the face and most of the figure of Apollo are destroyed. The inscription above and below this central design runs "Titus Senricus Felix, citizen of Puteoli, made this, and his pupil Amor, citizen of Carthage." The outside field divided into four parts, represents four hunting scenes ; the start in the morning with a tame stag, taken as a decoy, two hunting scenes, and an invocation to Diana. M. Babélon recalls the similar representation (also probably coming from Carthage) on the Prænestè Phœnician bronze bowl, the subject of the famous *mémoire* by M. Clermont Ganneau. We shall be interested to learn where this valuable mosaic goes to.

WHAT the Egyptian Exploration Fund has recently done for Egyptology is by now matter for European fame ; what it has done, what we confidently hope it will do for the history of Greek art, and especially of Greek ceramics, is less well known. Happily the Fund has had for its chief promoter a scholar whose sympathies are wide enough to embrace both East and West. From Nebeirah has just arrived a case containing samples of the treasure-trove. With a wise liberality these specimens are shown to the public in the right-hand wall-case of the fourth vase-room of the British Museum. In a few weeks more eight large cases are expected. When these appear we shall hope to notice and comment on the find in detail. Till then we must be content to point out that, to the student of ancient pottery, and specially that of the archaic period, the fragments already sent are of the first importance. We note in particular a fragment painted in delicate colours, with a chorus of female figures dancing hand in hand, another fragment of a woman figure inscribed in archaic letters on either side, some fragments painted with red-yellow designs like the early Ephesus pottery, another with a chimaira of novel pattern, some fragments which seem to us to be of the Dipylon style. All these are of the early archaic period and some are marked by a specially delicate naturalism. Of the black figured period we have a fragment with a negro's head, very carefully executed ; and last, though no wise least, a cylix nearly complete with the design of Odysseus carried by the ram.

THE completion of the Canadian Pacific Railway is not only a prominent incident, even in these days of gigantic engineering undertakings, but is one that directly affects British interests, as being the first successful effort to bridge the North American Continent across Canadian territory, and thus bringing the resources of the Atlantic coast into immediate connexion with those of the Pacific. In the more southerly portions of the Western Hemisphere, the Americans have already done this by the building of three enormous trans-Continental systems, two of which place New York in direct communication with San Francisco,—the one *viâ* Chicago, Omaha, Ogden, and Sacramento; the other by St. Louis, Kansas City, Topeka, Santa Fé, and Los Angeles. The third and most recent runs from Chicago by St. Paul, Bismark, and Helena, to Portland on the Oregon coast, and is known as the North Pacific Railway. In point of distance, however, the Canadian system has the advantage of them all, the mileage from Montreal to Port Moody, in British Columbia, being only 2,870, while that from New York to San Francisco is 3,331 by the shortest of the United States lines, so that, as a matter of fact, the two largest American cities are nearer to the Pacific by the Canadian road than by their own. The moral effect of the completion of this great artery to the British possessions can scarcely be over-estimated, either for business or governmental purposes. Troops can now be conveyed from Halifax to Vancouver's Island in seven days ; and it is not too much to say that the quelling of Riel's rebellion has, to a great extent, been facilitated by the proximity of the rails to the disaffected country. A vast area is now made available for agricultural undertakings, while the wheat crops of the far North-West, the cattle of the Rocky Mountain ranches, the fisheries of the North Pacific coast, and the gold mines of British Columbia will be brought within three weeks of the English markets. By the establishment of regular lines of ocean steamers, as contemplated, the time now occupied between England, China, and Japan will be reduced by at least one third, while, last but not least, one of the wealthiest points in the British dominions, and the least guarded against Russian aggression, will now be fortified a hundred-fold, both actually and morally. The Canadian Pacific has forged another great link in the homogeneity of the confederation, and the establishment over the sea of a vast British kingdom as large as Europe, and more than half the size of the United States.

THE truth that there are always two sides to a shield is sometimes illustrated in a remarkable and unexpected manner ; and although dirt (euphemistically defined by Lord Palmerston as matter in the wrong place) is constantly found as a practical element in social life, it is rarely that it has apologists hardy enough to defend its presence. But this has now happened, and in such a forcible way that many people will begin to doubt the doctrine of cleanliness being next to godliness. It appears that, anent the Crofters' question, somebody has been describing in the *Times* the filthy condition of Highlanders' houses generally, as being dark, unhealthy, and miserable, the occupants, both man and beast, having no light or ventilation save from the aperture through which the smoke escapes. However, a Highlander has started up to do battle for the beloved bothies in which he passed his early days, and to which he attributes all the blessings of his subsequent life, including a herculean frame and constitution. Not only, according to him, is the ventilation singularly effective, if rather draughty, but the continued inhalation of peat smoke, which generally brings tears to the eyes of the unacclimatised visitor, exercises marked beneficial results in protecting the lungs from consumption and other diseases that depend on various forms of parasite. This view is strongly corroborated by a Manchester physician, who points out that there certainly is a remarkable immunity from phthisis amongst the Highland race, and this he ascribes very largely to the inhalation of peat smoke, which contains many antiseptic ingredients, such as tar, creosote, and tannin, together with other volatile oils and resins. It is worth noting also that the Highlander whom an unkind fate afterwards drives into an ordinary chimneyed building, thereby lowering his stamina, loses his charmed existence, and becomes as liable as other beings of a lower order to the ills and diseases to which flesh is heir.

THE Vicar and Churchwardens of Great Bookham, near Leatherhead, have given notice of their intention to apply for a faculty for the complete restoration of the parish church, for which purpose a sum of 1,700*l.* has been subscribed. A description of the intended alterations has been affixed to the church door, with an intimation that notice of objection should be forwarded to the Office of the Commissary of the Diocese of Winchester for the County of Surrey, 23, Knightrider-street, Doctors' Commons, not later than the 7th of June. The church was partially restored some years ago, when the south aisle was refaced externally, a new roof put to the chancel, and the stonework of the arcading in the interior scraped and pointed. The most conspicuous features in the church at present are two monuments, one on the north side and one on the south side of the chancel, to the memory of William Moore, of Polesden, the eldest son of Archer Moore, of Fetcham Park, one of the Lords Commissioners for Trade and Plantations in the reign of Queen Anne, and M.P. for Banbury, who died in 1746 ; and of Colonel Thomas Moore, a younger brother of Arthur Moore, who planted Fetcham Park and built the mansion, now the residence of Mr. J.

Barnard-Hankey, but who is chiefly memorable for an amusing squabble with Pope, who, he alleged, plagiarised his verses. These monuments, which are of considerable merit and are very characteristic of the art of the period, are proposed to be removed and to be refixed on the north wall of the north aisle. It is proposed to re-arrange the memorial tablets in the chancel. If any of these have marked the site of an ancient interment this is a step which should not be taken unless absolutely necessary. On the north wall of the north aisle is a tablet to the memory of Louis Bazalgette, who died in 1830, but was not buried there, but in Marylebone Church, London.

AT the Church of San. Giovanni in Laterano' in Rome, the works in the transept consequent on the moving back of the east end of the choir, with its beautiful mosaics, are approaching completion. As far as lavish expenditure can go, all is being done, but that "all" is in the worst possible taste. Marble inlaid work of bad design, and gilding smothering every enrichment, are placed side by side with thirteenth-century mosaics, and the *tout ensemble* is as jarring as possible. The beautiful cloisters attached to this church are still divided up by partitioning and glazing, which certainly neither preserves them nor improves their effect.

AN exception to the general condemnation of Italian restoration should be made in the case of Orvieto Cathedral. The roofs of the nave and north aisle are being replaced, and the latter, which is nearly finished, really looks very well, and suits the character of the building. In form it is a lean-to, very much like one of the English fifteenth-century roofs, but with very much coarser details. The nave is to have a tie-beam roof, of much the same character and similar in design to the old one it is to replace. It is very probable, however, that, as at San Miniato at Florence, the timbers will be painted in very glaring colours.

THE Irrigation Commission in America has given an interesting account of windmill irrigation at Florin, about eight miles from Sacramento. It appears that formerly the neighbouring district was irrigated by channels led from the Sacramento river, previously to which time it had been impossible to obtain water by sinking wells, but since the saturation of the soil has taken place water is found at depths of 10 ft. to 20 ft. One particular farm visited had fifteen windmills on about 40 acres, which were cultivated chiefly with blackberries, strawberries, and table grapes. The first-named fruit were a variety as big as plums, and yielded about 4 tons per acre, as also did the grapes, which without irrigation could not produce one ton. The blackberries and strawberries are sold for 6 cents per pound at the nearest "canneries," but the grapes are carried by rail over 2,000 miles, as far as Chicago, where they fetch 30*l.* per ton. The soil at Florin, although poor on the surface, is underlaid by a "hard pan" formation containing lime and other elements, which, being brought into contact with water, decomposes and makes a rich mealy subsoil for sustaining deep-striking roots like that of the vine. The cost of the windmills varied from 12*l.* to 20*l.*, and that of the pump, with 50 ft. of piping, was about 3*l.* 12s.

AN endeavour towards imparting an artistic and attractive aspect to a very plain (nay, ugly) interior, has been taken in hand by a number of the students of the School of Design, in Edinburgh. The interior in question is an appendage to a mission church just completed at the north-west angle of the Grasmarket of that city. It would perhaps be too much to expect that the interior of a Presbyterian church should be decorated with mural paintings, but no objection could reasonably be taken to such decoration in a Sunday school. The church is lighted from one end and one side, and the blank wall surface would have afforded a wide field for ecoration; and it may probably, in the coursed of time, receive such. It is, however, in the Sunday-school, which occupies the ground-floor upon which the church has been superimposed, that the scheme of mural decoration is being followed out. The schoolroom, which is to be used for other quasi-clerical purposes, is lighted by square windows with central mullions; the ceiling is flat, and it and the walls are finished in plaster. The wall surface has been spaced out in upright panels by broad black lines, and each panel is to contain a cartoon in red chalk, taken from Millais's illustrations of the parables which appeared in *Good Words* several years ago. The figures are life-size, and the drawings are to be fixed by an after process. To make the scheme of decoration homogeneous, the spaces between the cartoons should be filled in by arabesques in pale blue or neutral tint. This experience affords to the students an opportunity for working on a large scale. If successful, it may lead to others of a like nature.

THE Exhibition of the Society of Painter-Etchers is one of the best and most interesting collections ever seen in the Dudley Gallery. It is very various in character, and offers examples of the many styles in which the beautiful art of the etcher can be used; not all, however, equally admirable or desirable. We have always held that the special power of etching lies, in addition to its peculiarly beautiful tone, in the facility it gives for absolute freedom of line and hand, and thus for the freest expression of the artists' individuality of touch and manipulation. Accordingly we do not see the highest or best use of the method in such elaborately and almost mechanically finished and shaded works as, for instance, Mr. David Law's "Bridge of Sighs" (74), which is only doing what engraving can do as well, and with more solid and permanent results. The other extreme, of scratching over a drawing with black ropes rather than lines, as in Mr. Aikman's "In Glen Lyon" (86), is perhaps also an exaggeration in the endeavour after force and freedom. Perhaps Mr. Ernest George's "The Bridge at Prague" (185), and Mr. Frank Duveneck's free and aërial-looking Venetian studies, best represent what etching can do with subjects in which architecture is prominent. M. Ford's "Notre Dame" (24) is fine in its way, but it is an affectation of mystery and loss of detail. Among the more solid and clear, but still not over-worked, architectural subjects, Mr. C. O. Murray's "The Virgin Porch, St. Mary's, Oxford" (175), is a good example, and Mr. Haig's "At the Fountain of St. George, Evening" (196). There are some fine landscape studies, and a variety of work of great interest. We have merely touched on a few which illustrate our special point as to the proper powers of etching, especially when dealing with architectural subjects, which, we may observe, form a large proportion of the collection.

OUR correspondent in Paris referred, in a communication some weeks ago, to the series of studies of the costumes and uniforms of the French army, which M. Detaille has been executing for the work to be brought out under the title "L'Armée Française," the text by M. Jules Richard. These drawings are now to be seen at MM. Boussod & Valadon's (late Goupil's), in New Bond-street, and are well worth a visit from those who appreciate brilliant drawing of figure and costume, and who are interested in the history of military appointments. Some of the photo-gravure reproductions, in monochrome and colour, which are also exhibited, showing the form in which the illustrations will eventually appear, are marvels of reproduction. One or two of the coloured ones it would be really difficult to distinguish from the originals except for the slight reduction in size.

THE exhibition of engravings by Woollett, now on view at the Fine Art Society's rooms in New Bond-street, forms a good illustration of the powers of the greatest of the old school of English line-engravers. These works want, of course, the refinement and some of the aërial effect which has been attained in modern engraving, but they are marked by a power and solidity and a patient thoroughness of execution, which is a curious, and, in some respects, a healthy contrast to the easier and shorter methods of much modern engraving, with its sensational effects of high lights and dashes and slashes, and dim suggestion of detail which is not worked out.

THE most notable work in the exhibition of the Society of British Artists is of course the portrait of Señor Sarasate by Mr. Whistler, which has given a sort of *éclat* to this year's exhibition. It is a masterpiece of character in portraiture, but the face is very cadaverous in colour, a sacrifice to the scheme of colour of the whole, which is called "an arrangement in black," and, not to clash with this, the colour is driven from the face and the shirt-front (it is evening dress) reduced to a dirty grey. The result is not pleasing as a portrait, but as a painter's study it is eminently clever and characteristic. The best thing we saw at the exhibition, besides this, was a semi-impressionist "Picture of a Little Girl" (51), by Mr. Harper Pennington. Mr. Wyllie's "In the Essex Marshes" (344) is a fine landscape.

A CURIOUS example of the prevalent indifference of scientific men to art is furnished in relation to the recent unveiling by Sir Spencer Wells of a medallion portrait of the late Mr. Peter Squire, at the Pharmaceutical Society's House in Bloomsbury-square. A copy of the Pharmaceutical Society's *Journal* has been forwarded to us, in which six columns are devoted to a report of the proceedings and of the speeches, in the whole of which report there is not a reference to the name of the artist who produced the medallion, although it was commended as a very good likeness, and the artist's name was, as we find, specially mentioned by Sir Spencer Wells in his speech. We presume that the members of the Pharmaceutical Society believe that a medallion which is "a very good likeness" is secreted by some spontaneous process of chemical action. We will supply the omission by recording that the sculptor whose work was commended was Mr. Brock.

THE lucubrations of the "British Matron" in the *Times*, to which we referred last week, led to a considerable correspondence on the subject of nude pictures, including a great deal of nonsense on both sides; for the artists who wrote in defence were as illogical in their reasonings, and as completely missed the real point at issue, as most of their opponents. A characteristic light was thrown on the distinction between prudery and modesty by a letter from a lady, evidently a very different stamp of person from the "British Matron," who said that her daughter of seventeen, who had before looked at and criticised the pictures at the Grosvenor, saw with surprise the correspondence in the *Times*, and exclaimed, "Why mother, we saw nothing improper at the Grosvenor." The correspondence had, however, the effect of eliciting a really valuable and thoughtful letter in the *Times* of Monday, the 25th, from a correspondent signing himself "H.," who has the rare faculty of seeing both sides of the question, which the artists mostly have not. We hope his letter has been read, marked, learned, and inwardly digested by both painters and public.

Huddersfield.—On the 9th inst. the memorial stone of a new junior mixed department to the Mount Pleasant Schools, Huddersfield, was laid by Mr. J. E. Willans, J.P., chairman of the Finance and Works Committee of the Huddersfield School Board. The original school was erected about ten years since. The new department will accommodate 460 children of both sexes, in the first and second standards. There is also a room for teaching cooking to fifty of the elder girls. In the new works are included extensive playgrounds, and also covered playsheds for the infants' department, and sundry alterations to improve the old buildings. The contracts have been entered into to the amount of 5,411*l.* The style of the building is Early Gothic. The architects are Messrs. Henman & Harrison, of London.

ARCHITECTURE AT THE ROYAL ACADEMY.*

IF the truth must be told, the exhibition is not this year very strong in the department of domestic art. There are no works of exceptional importance in point of magnitude, and the smaller works are not distinguished by any great originality of treatment. If the walls were stripped of some half-dozen drawings there would really be nothing left for special comment, so far as this branch of architecture is concerned. As the footman in *Punch* thought it high time "some new hanimal was inwented" to give the jaded appetite a filip, we are tempted to think that the time is ripe for a new man who shall give to our house architecture a fresh impulse. This may be ingratitude; but it is, at any rate, human nature. Was it Edward III. who requested the literary lights of his Court to "boke some newe thing"? "Newe things" ever were and ever will be in request, and architects must not expect to escape the common fate. We tire of the best art if it is a repetition of the same art. When Columbus first made his egg stand on end it was doubtless looked upon as a very pretty feat; but when every one could accomplish it, and its only excitement of novelty had worn off, we may be sure that his companions soon discarded, and perhaps derided the stale trick. The architectural gallery is full of the work of second-hand Columbuses. We must, of course, except from these remarks the always original work of Messrs. Ernest George & Peto, artists in a double sense. The houses they build are every way excellent, and the drawings which they contribute are always amongst the freshest and most interesting in the room. But the houses are not like the drawings, and consequently the drawings are not true illustrations of the houses. As a fact their cornices are, like every one else's, ranged in scrupulously level lines, their chimney-stacks are in reality carefully plumbed, and do not totter to their fall and in hopeless disrepair; their casements are not "crazy," and their roofs do not "sag." Nor do the servants of the house hang out their hearthrugs from the outer walls or display their lingerie to break the long lines of balustrade and balcony. Even South Kensington has not carried its æstheticism to this pitch. Nay, we have even noticed that Mr. Ernest George's own beautiful residence is as correct and decorous in these respects as the most Philistine of its neighbours. It is only in his drawings that these aids to the picturesque are seen, and we would be the last to wish them away. There have been architects who could make exquisite drawings, but who could not translate their designs into bricks and mortar, and there have been others who could build divinely, but could not make such a picture of their works as would have a ghost of a chance with the Hanging Committee. In Mr. Ernest George we have an architect who can do both equally well, and long may he live to delight us alike by his buildings and his draughtsmanship.

The "House at Ascot" (1,874) gains a special interest by the addition of an attached chapel, which is apparently designed to accommodate an outdoor congregation of (perhaps) tenants as well as the members of "the family." The axis of the chapel forms a very obtuse angle with the drawing-room front from which it projects,—an obliquity which is not, we think, expressed in the perspective. Ever since the house built by Mr. Shaw for Mr. Goodall, in which the studio was so aligned, the arrangement has been a favourite one. And where considerations of aspect,—such as obtaining a north light for the painter,—are present, the arrangement is not only defensible, but commendable. In the present case, the exact orientation of the sanctuary cannot have been the motive, and the departure from the right angle is too slight for attention in that respect. It is, of course, possible, that the object was to broaden the prospect from the drawing-room window, which fills the re-entering angle where the chapel and the drawing-room meet; or the arrangement may be merely fanciful, and, if so, savours a little of affectation. The plan of this house should be studied carefully, for it is perfect. To appreciate its great merit, the student has only to compare it with the plan on 1,945, which is also a design for a country house, by, we should imagine, a very young man. The Ascot plan has all the agreeable quaintness which we desiderate in a country house, but comfort and convenience are never sacrificed, or even jeopardised, and light and air permeate every corner of it. Externally, the changes are adroitly rung on features familiar in all this artist's works. The long series of flat gables, the bracketed oriels, the quarry glazing, the hanging tiling, the dodgy little windows in unexpected places, and at all sorts of levels,—we have them all once more. This species of design scarcely rises to the level of high art, being a revival of a manner which was a couple of hundred years ago accomplished by the unaided workman. Nevertheless, the difficulty of attaining a due soberness without dulness, and a becoming piquancy without a Cockneyfied fussiness, is greater than most people think. That it is difficult is proved by the fact that, whereas so many attempt it, so few succeed. Woolpits (1,765) and Collingham Garden (1,854) are more ambitious, and, we think, less successful designs. But we can never be sufficiently grateful to the school of architects who give us these pleasant effective combinations of agreeable colour and picturesque outline. The real old English houses are fast vanishing, and it is a matter for sincere congratulation that their place is being filled by worthy successors, and that the country is not to be given over to the dreadful monotony of ugliness which so recently held undisputed sway in the land.

The Restoration of Naworth Castle, by C. F. Fergusson (1,844-7 and 1,883-6), is shown in two series of brilliant pen sketches by Mr. E. F. C. Clarke, which are deservedly hung where they can be well seen. This is unfortunately not the case with Mr. Halsey Ricardo's single contribution (1,808), "Westgates," near Charlwood, Surrey, which is too high for due examination. For this reason we cannot follow the plan at all, and can only say that the house is homelike and quiet in treatment, and late Tudor in style, artistically composed, and quite satisfactory in its general effect. It strikes one as an odd circumstance that only one small chimney-stack is seen. This fortunately comes in the precisely right place for the grouping of the building, and we must take the author's word that the others are duly accounted for.

The additions to Stowell Park (1,756 and 1,757), by Mr. J. Belcher, are shown in a beautiful geometrical drawing. An old and very fine Early Tudor house has been extended with so much of the feeling of the old work that it is difficult to say where the old ends and the new begins. We should have liked a plan in further explanation; but the only sure way to exhibit the plan is to draw it on the same sheet as the elevation, for we find that the committee are very apt to reject plans if separately sent, be they ever so interesting.

In 1,945 Mr. Fitzroy sends a "Design for a Country House," which, so far as the elevation goes, shows careful study of old work and much facility of composition and draughtsmanship.

With a reference to Mr. Flockhart's "House and Studio, Abbey-road, St. John's Wood" (1,742 and 1,745), we must close our remarks. As a design it is admirable for effective grouping and appropriate detail, and as an example of free pen-and-ink sketching it is a veritable *tour de force*. There are some other designs and drawings in the gallery which would deserve a more particular notice but for the fact that they are little more than repetitions, appearing under different names, of what we have before carefully analysed. So strong a resemblance do they bear to the previous works of the same authors that our first impression is that they are old acquaintances, and that in spite of their fixed rule the Royal Academy has admitted drawings after previous public exhibition.

* See pp. 607, 650, 684, 720, *ante*.

Woodford (Essex) School Board.—This Board, having decided to enlarge their Churchfield Schools, consulted Mr. Edward Tedman, C.E. (who has, as surveyor to the London and Suburban Sanitary Association, just carried out a new system of ventilation and sanitation at these schools), and instructed him to prepare plans of a new infant school to accommodate 200 children. These plans were examined by the Board at their meeting on the 22nd inst., and approved, the architect being instructed to obtain the approval of the Educational Department, and to obtain tenders for the work, to be submitted to a future meeting of the Board.

NOTES AT THE PARIS *SALON*.*

CONTINUING our remarks on *genre* paintings, it is in that category that we must place the "Faust" of M. J. P. Laurens, a small picture of sober and harmonious colour,—a picture well fitted to sonsole us for the "tableaux érotiques" which the jury tolerate, to the great prejudice of art and artists. Accordingly, in the mere interests of M. Henri Pille, we pass in silence a Rabelaisian scene unworthy of his talents, and which he entitles "Tentation." As to M. Roll, what does he wish to prove in his picture of a nude woman caressing a black ball in a sunlit landscape? It is the fancy of a painter taken with the play of light and shade on the flesh; but that sort of study belongs to the *atelier*, and not to public exhibitions.

The landscape and animal painters form a very numerous party in the class of *genre*. Among the first, M. Pasini, with his small finely-finished scenes, and M. Guillaumet, with his broadly-painted Algerian subjects, remain both of them faithful to the East. M. François, for his part, is eternally Italian; while MM. Harpignies, Emile Bréton, and Harmoteau, transport us here and there to those green fields of France, the poetry of which M. Jules Bréton also knows so well how to render. Here, again, we must distinguish the old school, represented by MM. Ciceri, Curzon, Bellel, and Vidal, whose mannered works bear an unmistakable date; and the young artists, such as MM. Paul Collin and Pelouze. The latter exhibits a cliff scene, bounded by the distant sea, of great simplicity of composition. This picture, and the views in Holland of M. Grandsire, the luminous sea-paintings of MM. Boudin and Lapostollet, and the Breton landscapes of Madame Elodie Lavilette, merit especial mention among this group of painters, who love open air and the changing movement of the sea. MM. Lepine and L. Loir, they do not leave Paris, and confine their ambition to reproducing the various perspectives of the Seine, and the many aspects of the panorama of the Tuileries.

Among the animal paintings may be mentioned the cattle of MM. Barillot, Bonnefoy, Marais, and Julien Dupré, the dogs of M. de Penne, the powerful "attelages de bœufs" of M. Princeteau, and the "toro colante" of M. Aimé Morot, a veritable reminiscence of Goya, which transports us to the Spanish bull-fight at once.

We may class among the *genre* painting the marvellous paintings of objects of art made by M. Blaise Desgoffe, from the collection of Sir R. Wallace. Why does he not confine his talent to this inimitable painting of jewels and precious stones? By the side of the still-life pieces of of MM. Vollon, Philipe Rousseau, and Bergeret, the fruits of M. Desgoffe want truth and texture. They are of agate, like the dish which supports them.

Portraits.—Under this class we must evidently place the graceful profile which M. Henner, the painter of pearly-toned nymphs, has given under the title "Fabiola." We prefer the portraits of M. Paul Dubois. This eminent sculptor often abandons the clay for the palette, and then reveals himself as a colourist of the first order. There is masterly power in his head of an infant standing out from a crimson background, which gives force and effect to an exquisite piece of modelling. His harmonious portrait of a young woman, entirely in brown tones, is more seductive than the brilliant colouring of M. Carolus-Duran. It would be unjust, nevertheless, not to praise the latter for the great ability with which he arranges his draperies and laces, and makes the lights flash from the silks. In his "Portrait of Miss . . . ." the head with the aureole of blonde hair is charming in expression, but it has not the calm and masterly simplicity of the works of M. Delaunay.

"Autour d'un Piano" is a collection of curious portraits of solid execution, which M. Fantin-Latour has grouped with admirably studied realism. Very remarkable also is the portrait which M. Jean Sarjent exhibits this year. Perhaps he has cut out a little too hardly this silhouette of a young lady in a grey dress relieved against dark oak woodwork. Mr. Whistler's "Portrait of Lady Archibald Campbell" recalls the painters of the Spanish school. The sombre dress and the otter fur are almost indistinguishable from the tone of the background, the head alone forms a luminous point

* See p. 721., *ante*.

and detaches itself, fine and graceful, from this artificial obscurity. There is remarkable talent in this portrait, which the public like little and do not understand at all.

Here now we come to a picture at once political and impressionist. M. Raffaeli has represented M. Clémenceau at a public meeting, standing with his hand resting on a red table-cloth and surrounded by electors, certainly true to the life, in the triviality of types which they represent. This sensational picture, however, will not class M. Raffaeli among the great modern painters. With a different method, M. Jobbé Duval, who is a "classique," has arrived at nearly the same results. His colleagues of the Conseil Municipal of Paris, sufficiently true as to likeness, are shown in cadaverous and very disagreeable colours. In mentioning the study by M. Breslau, entitled "Chez Soi," the charming head by M. Chartran, the elegant figure in Louis XV. costume by M. Léon Comerre, and the two finely-finished works by M. Mathey, we shall have mentioned, we believe, the most interesting portraits of the *Salon*. We have reached besides the limits of our space, which will not allow us to mention the drawings, water-colours, pastels, and engravings, which include, nevertheless, a great deal of interesting work; and there are many other things which we have been obliged to pass over. We hope, nevertheless, that among the 3,000 pictures exhibited this year we have made so impartial a selection as to indicate at once the high qualities of some, the errors of others, and the general sum of the talent displayed by the painters of the *Salon* of 1885.

Sculpture.—This essentially monumental art demands Municipal and State competitions to allow it free scope for development. This kind of encouragement has been slack of late. For two years the Municipality has made few purchases and the State still less; the artists, wearied of labour which brings nothing, and alarmed at expense without results, are discouraged in the fight and dare not put forth their powers for the *Salon;* and the present exhibition is thus inferior to its predecessors. There are many reproductions in marble and bronze of works already known, but few new and original productions. Considering the demands of the budget and the deficit in the *octroi*, what will become next year of the credit of the city in the fine arts, already too restricted in the present year?

Monumental Sculpture.—We notice first in this category the "Triomphe de Silène," by M. Dalou, a group full of spirit, but somewhat brutal withal, though very interesting and composed with a feeling for decorative effect. We prefer, however, the memorial statue of "Blanqui" by the same artist, the rigid form of which is designed with great power beneath the shroud whence issues an emaciated arm. The head has an expression of suffering, and the crown of thorns placed at the feet symbolises the vicissitudes through which the old revolutionary has passed. The marble statue of "Madame la Duchesse d'Orleans," mother of the Comte de Paris, which M. Chapu has executed for the Chapel at Dreux, contrasts by its calm beauty with the nervous work of M. Dalou. This latter monument is of remarkable execution and fine sentiment. The same qualities are apparent in the figure of the young woman whom M. Mercié shows us veiled and sleeping. There is a sweet and melancholy feeling in this charming figure entitled "Souvenir," which is to adorn the tomb of Madame Chas. Ferry, daughter of M. Allain Targé, Ministre de l'Intérieur.

This is a decisive year for M. Daillion, whose marble figure "Reveil d'Adam" is a work in a great manner, the property of the City of Paris. It is also for the municipality that M. Paris has executed his "Le Temps et la Chanson," a fine group in marble, and M. Vital Cornu his marble statue "l'Abondance"; and for the municipality also are commissioned the "Héraut d'Armes" of M. Cordonnier, the "Marat" of M. Baffier, and "L'Aveugle et le Paralytique" of M. Michel.* M. Daillion has also a group entitled "Bonheur," which merits special mention. Another work to be noted is that of M. Demaille, in which the principal figure, draped in antique fashion, seems protecting two young children, while with the other arm she embraces a young girl who regards her tenderly. This group, entitled "Protection," has a fine decorative outline, and the manner is full of calm and noble expression. We like less the marble bas-relief by M. Hector Lemaire, intended for the Mairie of the Sixteenth Arrondissement, and which personifies "l'Hyménée." The general aspect is too flat, and the main lines are crushed by the architecture which surrounds it.

Among the commemorative monuments, numerous enough this year, figures the bronze statue of Francis Garnier, intended for the town of Saïgon. M. T. Noël has perfectly rendered the expressive head of the brilliant officer of marines killed in the first Tonkin expedition. We may mention also a group which M. P. Ogé calls "baptême gaulois," a young woman making her child kiss his father's sword. This is a work in a fine style; but unfortunately a little further on we meet with "La Sentinelle Gauloise" of M. Desca, the "Guerriers Gaulois" of M. Quinton, the "Fierté Gauloise" of M. Vital Cornu; and in spite of the talent of these artists, we find, as in the rooms above, the "gaulois" idea somewhat overworked. It becomes monotonous. We must not forget the bronze statue of General Joubert, intended for the town of Bourg, an energetic and stirring work by M. Aubé.

Genre Sculpture.—As in painting, so in sculpture, one can easily remark the tendencies of the modern school, which puts aside antique formulas to attack resolutely the realities around it. One may say that in this branch of art the revolution is already partly accomplished, although it is more difficult for the sculptor than for the painter to render the realism of fact with due regard to the decorative principle of his art. A too faithful interpretation easily borders on triviality, and that is why the "Jacques Bonhomme" of M. Baffier, with his well-developed muscles, his hard and wrinkled torso, and his grimacing head, is only a vulgar and disagreeable study. On the other hand there is the "Jeune Mère" of M. Chrétien, whose elegant form is so perfectly modelled under the coarse clothing of the peasant. The "Premiers Pas" of M. Henri Plé is equally a modern subject, graceful and well treated. Lastly, the robust blacksmith of M. Gautherin, personifying "Le Travail," is the work of an artist who knows how to give to a leather apron and the folds of a blouse the elegance of line indispensable to his art.

Among the *genre* sculpture we must class the "Molière Mourant" of M. Allouard, the elegant "Salomé" of M. Schœnewerk, the "Diane Chasseresse" of M. Falguière, a work of great talent, but of which the posture and action are too exaggerated to please. We must mention also a delightful statuette in ivory by M. Moreau Vauthier, "La Peinture," heightened with gold-work and precious stones.

We terminate this rapid review by the series of busts and medallions which always occupy a considerable place in the *Salon*. Among the first, let us name that of the painter Harpignies by M. Hiolle, the bust of M. Antonin Proust by M. Rodin, who also exhibits some magnificent medallions; the bust of M. Coppée by M. Delaplanche; that of the architect Guirain by M. Thomas; that of M. Marmontel by M. Barrias; that of Émile Augier by M. Francesci, &c. But space is wanting, and we must conclude by noticing the admirable medallion commemorative of the Hôtel de Ville by M. Chaplain, of which we hope shortly to give an illustration.

There are in this branch of art, as will be gathered, works of great merit, though in a lesser number than last year. We have given above our idea as to the causes of this momentary arrest of the onward movement of an art which is nevertheless very remarkably represented at the *Salon*. Yet one may say that in spite of certain deficiencies, the modern school of French sculpture continues worthily the traditions of Pradier, Rude, and David d'Angers, and that French sculpture is still the sound and robust art which has given us so many masterpieces, and of which France has just reason to be proud.

R. B. FENWICK.

* Yet this is in a year when, as our correspondent observes, less public encouragement than usual has been given to sculpture. What a lesson for our Government! —ED.

Association of Municipal and Sanitary Engineers and Surveyors.—The Lord Mayor has signified his intention of receiving and entertaining the members of this Association on the occasion of the annual meeting, which is to be held in London at the end of June.

THE INVENTIONS EXHIBITION.

PRIME MOVERS.—I.

OUR greatest of prime movers, the steam-engine, and its modern ally, the gas-engine, may, on the whole, be said to be fairly well represented at South Kensington; but the same cannot be affirmed of their predecessors who utilise the natural forces of wind and water,—water-wheels and wind-mills being almost entirely absent. This is probably a case of the "survival of the fittest," but it is nevertheless to be regretted, as the use of water-wheels, turbines, and hydraulic engines, where a good fall or pressure of water is attainable, is of very great commercial value, unless the site be an isolated one. Windmills, too, may be made extremely useful for irrigation and drainage, and they have an advantage of requiring little or no skilled attention.

Returning to the steam-engine: during recent years the attention of the majority of engineers appears to have been devoted rather to simplifying and perfecting existing types than to venturing on fresh and unknown lines; this may, however, in a measure be attributed to the severe and long-continued trade depression under which the country has suffered, which has reduced the amount of money manufacturers can afford to devote to experimental purposes to a very small sum. We do not, however, wish it to be understood from this remark that invention with reference to prime movers has been at a standstill. The chief departures have been in the rapid development of the compound system in steam-engines, which, in addition to marine and stationary, is now to be found in portable, vertical, and locomotive engines. What are known as high-speed engines have also been considerably developed, and although they may be held to be as yet in their infancy, the value of some of them as motors for certain kinds of duty has been sufficiently proved, and still more interesting results may be looked for. Gas engines, too, have much advanced and come largely into use, and for small powers,—say up to 8-h.p.—are, without doubt, very valuable as motors. They are also interesting from the fact that unlike steam-engines they do away with the use of water as a medium for developing power, and are one step nearer the goal that engineering science has long striven for, viz., development of the heat contained in fuel directly into useful effect. Hot-air or caloric engines have made but little progress, although for very small powers they may be worked with economy.

The means of transmitting power from the prime movers to the receivers or machines driven have latterly increased considerably, compressed air, water, and electricity now being added to the older methods of belts, ropes, toothed and friction gearing, and steam. Most of these, but not all, are represented in the Exhibition.

Locomotive engines are not largely represented, as with the exception of Mr. Webb's compound, which we have already noticed, the exhibits are confined to a contractor's locomotive, fitted with a new form of valve gear, exhibited by Messrs. Manning & Wardle, of Leeds; and two steam tram-car engines by Messrs. Merryweather and Wilkinson respectively, with a small double bogie locomotive by the Fairlie Engine Co., Westminster.

A large horizontal engine, fitted with Wheelock Patent Expansion Gear, is exhibited by Messrs. Daniel Adamson & Co., of Dukinfield, near Manchester. The main frame of this engine is of the present popular girder type, which possesses some advantages,—notably cheapness of construction,—but also some disadvantages, upon which, however, we need not enter here. Perhaps the most important feature about the engine is the cut-off gear, which possesses, at any rate, the merit of extreme simplicity. The working parts are very few, and one eccentric works both the main steam and cut-off valves. The chief novelty claimed for this gear is, we believe, the suspension of the valves on hardened steel gudgeons and bushes; consequently the friction, and, therefore, the power required to work them, are reduced to a minimum.

The valves are all placed at the bottom of the cylinder, and effective arrangements are thus easily made for relieving them of water, &c. This is an improvement over the ordinary plan of placing valves above and below the cylinder, as a leakage may be taking place past the steam valves and into the exhaust for a considerable time without detection. In the Wheelock

engine this is rendered practically impossible by arranging the cut-off valves behind the main valves, so that, when they are open to the exhaust, before the steam can pass into the pipe, it must leak past both the cut-off and main valve faces.

The main valves are worked directly from the eccentric rod by levers keyed upon the valve spindles and the cut-off valves by a positive motion, obtained by means of bell-crank levers and a stirrup-link attached to a lever and riding on a loose collar. The cut-off valve has a concave face with double opening. This engine was in motion, but without driving anything, which is a pity, as it does not permit an inspection of the action of expansion gear under suddenly varying loads; but the makers inform us it has been largely tested in America, and in this country, for driving saw-mills, rolling-mills, callendering, &c., where the duty is intermittent and very severe, and that it will maintain a uniform rate of speed under all ordinary conditions.

Messrs. John Fowler & Co., of Leeds, exhibit several engines, including samples of their compound semi-fixed type. This class of engine has come largely into use of late, and, whether used as a fixture or a portable, presents several advantages not found in high-pressure engines of the ordinary construction. Chief amongst these is its economy in working: this is secured by using compound or high and low pressure cylinders, the steam in the boiler in the first instance being maintained at a high pressure, say 120 lb. or more per square inch, and after being used in the high-pressure cylinder, it is expanded down to a low-working pressure in the low-pressure cylinder. Another advantage of this arrangement is that automatic expansion gear, which in some cases is of complex construction and liable to get out of order, is done away with; at the same time great steadiness in working is secured. Messrs. Fowler's engines combine strength and simplicity of design with excellent workmanship. The boiler being required to work at a high pressure is made of steel, with an internal fire-box of Low Moor iron. The top of the fire-box is made circular, which, while adding to its strength, prevents the accumulation of sediment. We noticed that the boiler was extremely well and carefully stayed, an example that might be copied with advantage by some other makers we could mention, as in high-pressure boilers of this construction it is, to say the least, a matter of the highest importance. In utilising these engines for winding and similar purposes, Messrs. Fowler bolt the bed-plate on to a wrought-iron tank, which being sunk in the ground the necessity of expensive foundation is avoided. In feeding the boiler a separate donkey-pump, in conjunction with an injector, is used, instead of an ordinary feed-pump worked by the engine; the action of the engine in winding being intermittent, a more regular supply of water to the boiler can thus be secured. The winding drums and gearing are of steel, combining, as far as possible, strength with lightness.

An automatic expansive horizontal steam-engine is exhibited by Mr. R. Ogden, Ashton-under-Lyne (Ogden & Livesey's patent), which presents some features of novelty, notably in the construction of the cylinder. This consists of a pipe with flanges in lieu of a cylinder of the ordinary shape. The advantages claimed for this arrangement are that the expansion and contraction are uniform; that cylinders may be renewed very cheaply, the same valves and boxes being used again, and another, which we should consider a very dubious advantage, viz., that the cylinder waste-water taps are done away with, that duty being performed by the exhaust ports. Corliss valve gear is used. This engine has some good points in design, but instead of the cylinder being bolted to the end of the bed-plate we much prefer the old-fashioned plan,—still adhered to by some leading firms,—of an extended bed-plate with the cylinder resting on it. For small powers, a cylinder bolted on may pass, but for large powers we certainly,—to say the least,—fail to see any tangible advantages in the plan.

Messrs. J. T. Marshall & Co., Limited, Nottingham, show a compound undertype semi-fixed engine. The engine is mounted on steel girders, and the crank-shaft, plummer-blocks, and ash-pit, on which the fire-box rests, are in one casting. The piston-rod guides work in circular guide-boxes, and the governor is of the crossed-arm loaded type. The engine is neatly designed and made, but presents no special feature of novelty.

A considerable number of other under-type engines are exhibited, but there exists between these such a remarkable family likeness that, having already described that of Messrs. John Fowler & Co., it may be considered a good representative of the whole.

The largest engine in the Exhibition is that exhibited by Messrs. Hicks, Hargraves, & Co., of Bolton. It is of the Corliss type and fitted with Inglis's valve gear, and indicates some 150 h.p. at 60 lb. pressure. The cylinder is 20 in. diameter by 4 ft. stroke, is steam-jacketed, and built up with separate valve-chests. For driving, rope gear is employed, the fly-wheel being grooved for that purpose; the running of this engine is remarkably steady, and its general design is good, combining as it does strength with simplicity. In the same stand is are automatic barring engine for starting large engines when they stop near the dead centre: hitherto this has in most cases been done by hand, and is found very hard work. It would be difficult to describe the action of this engine without drawings; but, we may say briefly, it is fitted with a worm-wheel which gears into a toothed wheel attached to the fly-wheel of the large engine, and is so arranged that when it has set the large engine in motion, it immediately disengages or throws itself out of gear. The chief novelty of the engine is that both the falling in and out of gear movements are automatic, and the makers claim that theirs was the first engine made for this purpose in which the driving parts are arranged to throw out of gear by the starting of the main engine.

The electric light machinery is driven chiefly by under-type compound horizontal engines, fitted with automatic cut-off gear, and locomotive boilers, constructed by Messrs. Davey, Paxman, & Co., of Colchester. As these are the same as those used at the Health Exhibition, further description will be unnecessary. We noticed the boilers and pipes were covered by what was apparently a very excellent non-conducting composition for the prevention of radiation and the condensation of the steam in the pipes. A novelty in the way of automatic steam cut-offs was exhibited by Messrs. Chapman & Reed, of Holloway. In this engine the ordinary steam-chest, slide valves, and rods, are entirely dispensed with, and the steam enters directly on to the piston, and is acted on at either end of the cylinder by the cut-off gear. By this arrangement the full boiler pressure is admitted at once to either end of the cylinder. In conjunction with this gear is used a sensitive form of governor, in which worm-gearing is employed altogether. The engine possesses several features of interest, the development of which we shall look forward to with expectation.

Amongst high-speed engines, the Armington-Sims engine, exhibited by Messrs. Greenwood & Batley, of Leeds, attracted our attention, being of a type not usually utilised for high speeds, viz., the horizontal. In constructing high-speed engines after this fashion, the makers have evidently borne in mind the necessity of counteracting the increased wear and tear, vibration, &c., consequent on the high speed of running by combining in its construction, increased strength in the framework, larger area of bearings, and the best quality of workmanship and materials. The automatic cut-off is attached directly to the valve-rod, and varies the point of cut-off from the commencement to seven-tenths of the stroke without changing the lead. The makers claim that the variation in speed from an extremely light load to the full power of the engine does not exceed two per cent. If this result can be verified in practice when driving difficult machinery,—such as saw-mills,—it will speak well for the engine, it being a result rarely if ever attained. An engine of this type, with a cylinder 6·5 diameter by 8-in. stroke, is speeded to make 350 revolutions per minute, or a piston speed of 460 ft. per minute. These engines should be of service for electric lighting, ventilating, &c., purposes, where high speeds, without intermediate gear, are essential.

A somewhat remarkable novelty in the way of high-speed engines is the "Tower Spherical," exhibited by Messrs. Hernan & Froude, Newton Heath Ironworks, Manchester. To clearly understand the mechanism and action of this engine, a long description and drawings would be necessary, and even with these its working would not be by any means easy to comprehend,—in fact, it may be almost called a mechanical puzzle. We may say, however, that it consists "of a system of parts contained within a sphere, and so united as to enable them under the action of steam pressure to impart rotary motion to a shaft." It is said the idea of its construction occurred to the inventor through watching the relative motions of the three parts composing a universal joint, and these motions of the engine may be said to be founded strictly on geometrical principles. In all high-speed engines one of the chief difficulties is the matter of lubrication. In the engine under notice, this has been got over with much ingenuity. A chamber in the bed-plate contains the lubricant, in which is immersed a small plunger pump. The plunger is raised by a slow and intermittent ratchet motion from the main shaft, and in its downward stroke is driven by a worm on the shaft, causing it to descend promptly. By this means a definite small quantity of lubricant is injected at adjustable regular intervals with perfect certainty; and, being supplied by the quick stroke of the plunger, it is made to enter all the oil passages, instead of being absorbed by one only.

These engines have been tried for many months under varying and trying conditions, and with remarkable results, the working parts which we inspected presenting no signs of wear. An engine, 7 in. diameter, is speeded to make 650 revolutions, and for electric lighting and other purposes where a self-contained high-speed engine is required, we predict a prosperous future for the "Tower Spherical."

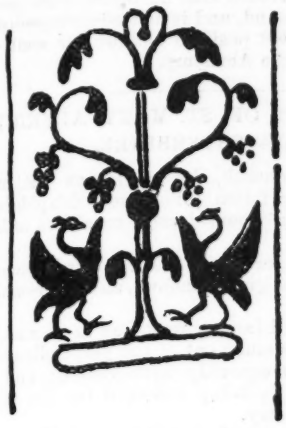
Messrs. Davey, Paxman, & Co., of Colchester, exhibit a single-acting compound quick-speed engine for driving dynamos direct from the crank-shaft, also a double-acting compound vertical engine for driving dynamos by means of gearing.

Messrs. D. & W. Robertson, London, show a small horizontal engine with suspended governor. As to the advantages to be derived from this arrangement we are not at present quite clear.

Messrs. Galloway, of Manchester, have two large engines driving the machinery in connexion with a number of Lancashire boilers, fitted with Galloway cross tubes. These boilers should be of special interest to builders and saw-mill owners, as nothing can be better for driving woodworking machinery, for, being provided with ample fire-grate surface, they may be utilised for burning all kinds of waste wood; they are also easily cleaned, repaired, and managed. By the use of the cross-tubes the heating surface is increased and the circulation of the water improved. In Messrs. Galloway's boilers the tubes are fixed so that they are nearer together at their lower than their upper ends: the strength of the back flue is thus considerably increased. The compound horizontal engine which was used for driving the machinery at the Health Exhibition has similar employment now, and we certainly prefer its general arrangement to the new engine recently erected.

At the stand of Messrs. Durham, Churchill, & Co., London, we noticed some practical-looking piston-ring packing. The makers claim that by its use a free yet steam-tight piston is obtained. It has a direct vertical and horizontal thrust, with neither thrust dependent on the other. This result is said to be obtained by the use of one spiral spring, or a series of compound springs. The compound spring is made out of a single rod, and is without sharp bearing points, these being flat vertically, and curved horizontally to the same radius as the inside of the piston rings. As a rule we object to the use of spiral springs when there is great variation in temperature or any constant and severe strains on them, as there is little doubt that in the first case the nature of the steel becomes altered, and they are liable to breakage, and in the second they become weakened and ineffective. The makers assert that for piston-rings they have stood all ordinary tests.

Messrs. Cochran & Co., of Birkenhead, show one of their vertical steam boilers, arranged wirh horizontal flue tubes; part of the shelf is cut away at each side of the boiler above the fire-box, and tubes are fitted across. The space between the tube-plate and the shelf of the boiler forms the combustion chamber on the one side and the smoke-box on the other; doors are fitted to both sides of the tube-plates, that on the combustion side being lined with fire brick. By this arrangement the tubes may be more easily cleaned and repaired than is the case with the vertical multitubular form, and the boiler altogether must be pronounced a decided improvement on these, and can be recommended for small powers and where space is an object.



Sicilian Mosaic

Fig. 6.

French tile

Fig. 7.

English tile

Fig. 8.

Pisa

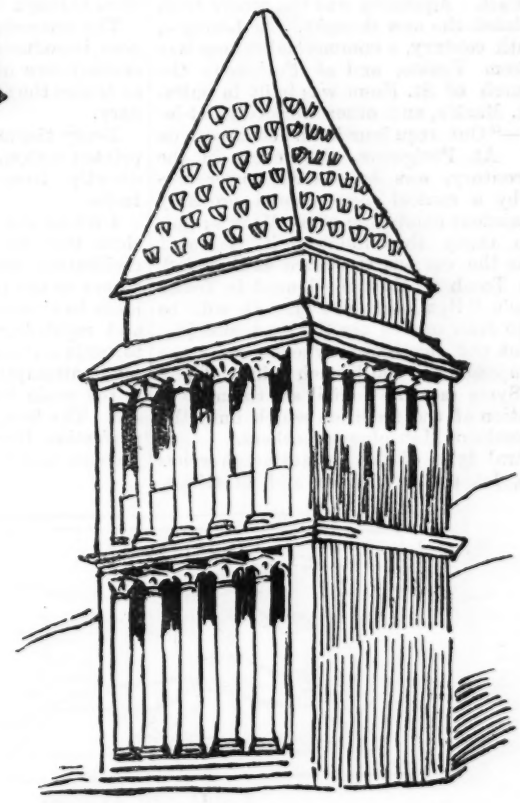
9.

Monreale

Fig. 11.

Chartres
(stained glass)

Fig. 12.



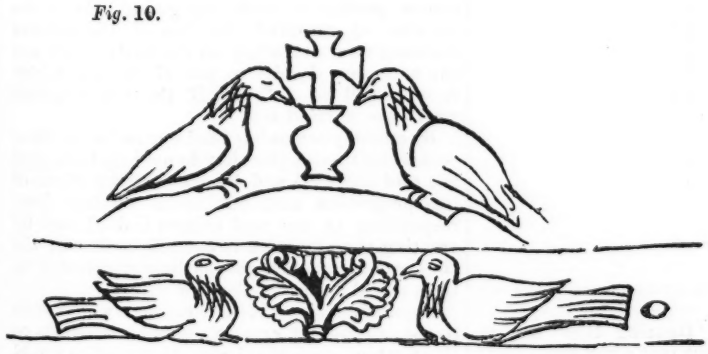
SYRIA

Tomb at Hass 4th Cent.

Fig. 13.

England:

Fig. 10.



WINCHESTER & EAST MEON:

Fig. 14.

THE LION AND THE PALM.*

NOTES ON RECURRING FORMS IN HISTORIC ORNAMENT.

THE early German School, which we should call Byzantine rather than Romanesque (the latter having become by usage identified with the decaying school of Rome) arose under Charlemagne, the influence coming chiefly from Ravenna and Venice, at Aix-la-Chapelle he had a church built obviously founded on St. Sophia.

It was in Byzantium that the ancient art of casting in bronze was remembered; the fine lion of Brunswick, of the tenth century apparently, was removed from Constantinople by Henry the Lion, and two of the series of great bronze doors which led up to those of Ghiberti were brought to Italy. At Hildesheim are probably the earliest of these bronze gates made outside the Eastern Empire. They were made by Bishop Bernward after he had returned from Italy in the suite of the Emperor Otho; these doors bear large knockers, a ring depending from the jaws of a lion, finely modelled in an Eastern manner. On the choir-screen of the same church we have niches covered with channelled domes of the Byzantine type; and the spandrels are filled with affronted birds with intertwined necks.

The next bronze doors we find at Augsburg, 1070; these are not so fine, but the designs are more to our present purpose, five or six of the panels being charged with lions, centaurs, and the lion and calf.

In Apulia in the twelfth century, there was a school of art of which the Pisan is an offshoot (Niccolo Pisano was probably born at Amalfi); here at Troja and Trani are some very fine gates by Barisannus 1150–79.

Bonnanno's doors at Pisa follow in 1180; the bottom panels have a row of symmetrically-placed palms. Both Barisannus, of Trani, and Bonnano, cast gates for the cathedral of Monreale, in Sicily.

I shall not dwell on the Venetian school, as its Saracenic character has been sufficiently pointed out by Mr. Ruskin. In Florence and other Italian cities it will be found that the germinating principle is Eastern, but just as the perfected Greek lost almost all traces of its origin, so it is with the great matured schools over Europe in the thirteenth century.

The most highly developed art of the twelfth century was probably that of Sicily; and it is at the same time the most evidently Eastern,—here the mosaics burst forth in sunset splendour, and in them we find beasts, birds, and palms wrought to an immense scale.

At Monreale in mosaic we find, as far as I know, for the first time, the bird and tree reduced to that more conventional form in which it spread to France and England, principally in encaustic tiles (these being, as has been well pointed out by Viollet-le-Duc, and amply substantiated by the form of some of the patterns of our Western substitute for mosaic). (See figs. 6, 7, and 8.)

In Jacquemart's "History of Furniture" there is illustrated a magnificent coronation robe now at Vienna; this bears an immense and truly Assyrian hom, and on either hand fierce conventionalised lions tear prostrate camels. This work bears the inscription (in Arabic), "Made in the happy city of Palermo

* See p. 722, *ante*.

. . . . in the year 1181 of the era of our Lord Jesus the Messiah."

About this time, the palm finally stiffened into that form which became the ornamental foliage of Gothic Europe until the thirteenth century, and which with us was the origin of the "Early English" trilobed form: this is exactly parallel to the Greek anthemium, on which, perhaps, it is partly based, both varieties being found on the baptistery doorway at Piss. (See figs. 9, 10, 11, and 12.)

Sicily under the Normans, Venice, and Spain transmitted the Eastern influence, and this was supplemented by the long residence of the Crusaders in Syria. It was probably in Sicily that the Byzantine style took that last imperceptible step which entitles it to be called Gothic, and in the fully-developed and magnificent variety of Gothic to be found there the features can be traced back to Syria, where five or six centuries before the column became a colonnette: the cornice was transformed into corbel table, or string; and the pilaster became a buttress strip.

In France the Roman tradition lingered long, influenced by the East, from the time of Charlemagne. In the north-west of Europe, as far as it had not been modified by the same influence, the art was Scandinavian,—a primitive offshoot from the East. Aquitaine was the centre from which radiated the new thought. At Limoges, in the tenth century, a commercial colony was founded from Venice, and at Perigueux the domed church of St. Front was built in imitation of St. Mark's, and other works Viollet-le-Duc says,—"Ont reçu leur influence directe de l'Orient." At Perigueux also, early in the eleventh century, was built a fine tower, surmounted by a conical spire, copied probably from the ancient campanile of St. Mark's; this spire, like many that followed it, is scaled exactly like the curious structure at Baghdad, called the Tomb of Ezekiel (figured in Texier and Pullan's "Byzantine Art"). It will be sufficient to draw one of the Syrian tombs (fig. 13) to point out the source whence came the Italian campanile and the French spire. These tombs of Syria (see De Vogüé) are themselves a continuation of the tradition which built the pyramid-tombs of Mausolus and others.

For central type of the Byzantine churches of France, let us take Arles and St. Gilles, especially the western portals, of which I have photographs before me. The columns are "diminished," and stand on lions. The acanthus-leaved capitals are of the crisp Syrian type, and have enormous cushion abaci,—all sure signs of their origin.

With us, as I have shown above, the palm developed into the Early English foliage; we find it while yet plainly the palm universal in the twelfth century. On the font at East Meon (1100) we find this form with the birds on either hand, but at Winchester (1110) the cross takes the place of the heathen tree of life (fig. 14).

A font in Berkin Church, Yorkshire, is surrounded by a series of panels, in most of which are lions devouring other beasts. At Exeter we find another instance, also the birds and an elephant; and in a late wall-painting in the Chapter House at Westminster are two other Eastern animals. They are affronted with a tree between, and in black letter is written **dromedary: kameyl.**

To make an end: if we trace up any of the lesser arts we shall be directly led to the East. The finest pottery made in Europe was the Spanish copper lustre, which was introduced by the Arabs from Persia.

Mediæval ivories are derived from the Ninevites through the Greeks.

The enamels of Limoges, which were, I suppose, introduced by the Venetians of the eleventh century, are of Byzantine and Oriental origin, as is also the art of the gem-engraver and lapidary.

Every tissue and stuff, from cloth of gold to printed cotton, is from the same source; some directly from Persia, and others through India.

I would say that I have not endeavoured to show that we owe our arts to Asia in that its civilisation was before that of Europe; but rather as the perennial source from whence our ideas have come, as well in design as in language and mythology; and I have made an essay towards a theory of coherence in the history of art in attempting to show that there have been in the main but two great cycles of Western art. The first, in its germ Assyrian, and in its perfection Greek; the second, commencing as Persian, and culminating in Gothic.

W. R. LETHABY.

A Slab from Xanthus.

Illustrations.

DESIGN FOR ADMIRALTY AND WAR OFFICE.

THIS is a perspective view in one of the courtyards as it would have appeared in the design by Mr. P. J. Marvin which was submitted in competition for the New Admiralty and War Offices, had the design been carried out. The present drawing, of course, was not submitted in the first competition, from which perspectives were excluded, but like some others we have published and shall publish, has been made since to the author's intentions.

The illustration is reproduced from the water-colour drawing now in the architectural room at the Royal Academy.

SCULPTURE AT THE ROYAL ACADEMY.

WE give this week illustrations of two of the most prominent and most able pieces of work in the Central Hall of the Academy Exhibition, the "Spartan Dancing Girl" of Mr. G. A. Lawson, and the "Autolycus" of Mr. E. Roscoe Mullins. We have commented sufficiently on both in our article on "Sculpture at the Royal Academy" (p. 717, *ante*). Mr. Lawson, however, sends us a few words which will assist in explaining the *motif* of the work: "My intention in the 'Dancing Girl' was to give the feeling of perfect rest after (supposed) vigorous exertion; the unconscious abandonment and grace of a supple figure. 'Spartan' would account for the nude treatment, for, as you know, in the Lycurgan age the youths and maidens contested in the games nude; running, dancing, &c. In short, my aim may be summed up by 'purity and grace'": the idea of repose after healthy athletic exercise being sensibly distinct from that of the ordinary type of "dancing girl reposing," of which we have had so many examples.

We asked Mr. Lawson for his reason for the differentiation of "Spartan" in the title of the work, which he gives as above. But in sculpture there is of course much more scope for the logical employment of the nude figure than in painting, because the form of art is much more abstract and ideal, and less imitative, than painting. Thus in Mr. Mullins's clever and expressive work, the object is to give the abstract idea of a certain type of human character. Dress would remove it from this abstract character, and fix it to a certain epoch and locality, which is exactly what is not wanted. Of course also the expressiveness of the actual figure, and the interest of modelling it, is far greater than that of modelling mere coverings. After the nonsense that has recently been written on the subject, a word or two on the point may not be out of place.

We should add that Mr. Mullins is anxious to have it understood that his figure is designed to be seen all round, and is not advantageously seen in its present position against the wall of the Gallery at the Academy.

THE CHURCH OF ST. MARY, ALFRICK, WORCESTERSHIRE.

THIS little church, by no means without interest, having fallen into a very dilapidated condition, required considerable repairs in order to preserve it.

The western portion of the nave is Norman, and retains its original windows, and will remain unaltered.

The north wall further west was in an unsafe condition, being much out of the perpendicular, and has been frequently buttressed up, and a portion of this is being removed for the new transept and vestry.

The general works include the removal of the plaster ceilings, bringing to light the original oak trussed roofs; the junction of the chancel and nave being marked by a half-timbered screen forming a chancel arch, and characteristic of Worcestershire work; in addition to which will be an oak chancel screen, the lower part of which is original, and was found on the removal of the high pews.

The space under the turret is being thrown into the church, and the upper portion enclosed with an oak-screen to form a ringing-chamber.

The church will be heated with hot-air by Mr. Constantine, of Manchester; the general contractor being Mr. J. Inwood, of Malvern; and the architect Mr. Aston Webb, of Westminster.

WESTMINSTER HALL.

IN preparing this design for *refronting* Westminster Hall in contradistinction to *restoring* (?) the grand old piece of national architecture, the author's chief aim has been to produce something to harmonise with the work of Sir Charles Barry, at the same time to fill up the hiatus which intervenes between St. Stephen's Hall and New Palace Yard.

The present aspect of this portion of the building is disgraceful, and the scheme herewith illustrated (by raising the parapet on the west side of the Hall to a considerable height, finishing it with enriched open panelling, the centre portion in each bay giving light to the interior, if required, in lieu of the hideous dormers now obtruding on the roof) would add the necessary dignity to the old Hall, in which it will still be deficient if the contemplated works are carried out.

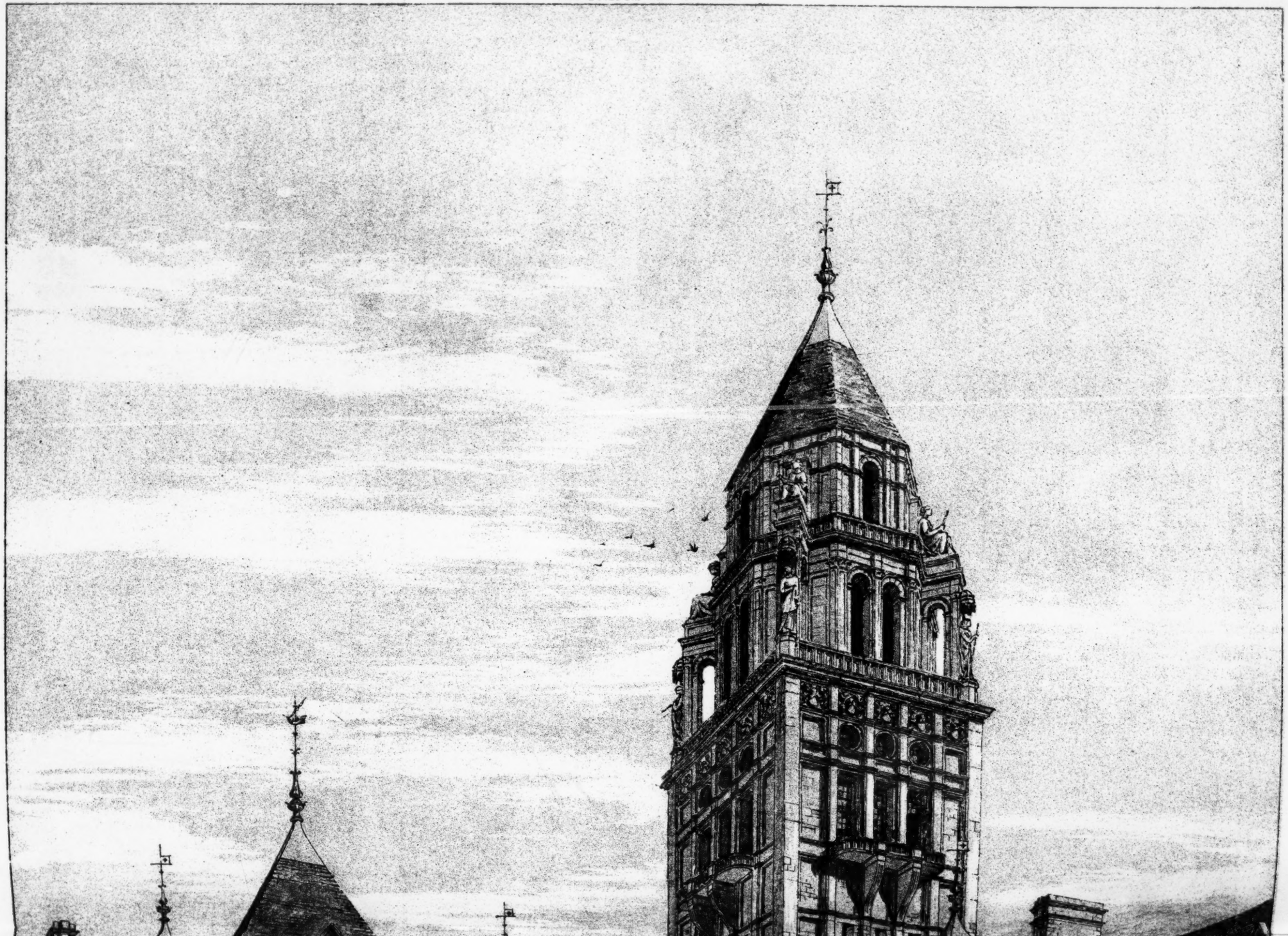
By entirely removing the huge and worse than useless buttresses (for they do not help to support the roof timbers) and by substituting others of less projection and double in number (corresponding to the roof trusses inside), and by erecting the pinnacles to the height shown; the Hall would by such means be incorporated in the general design of the new palace.

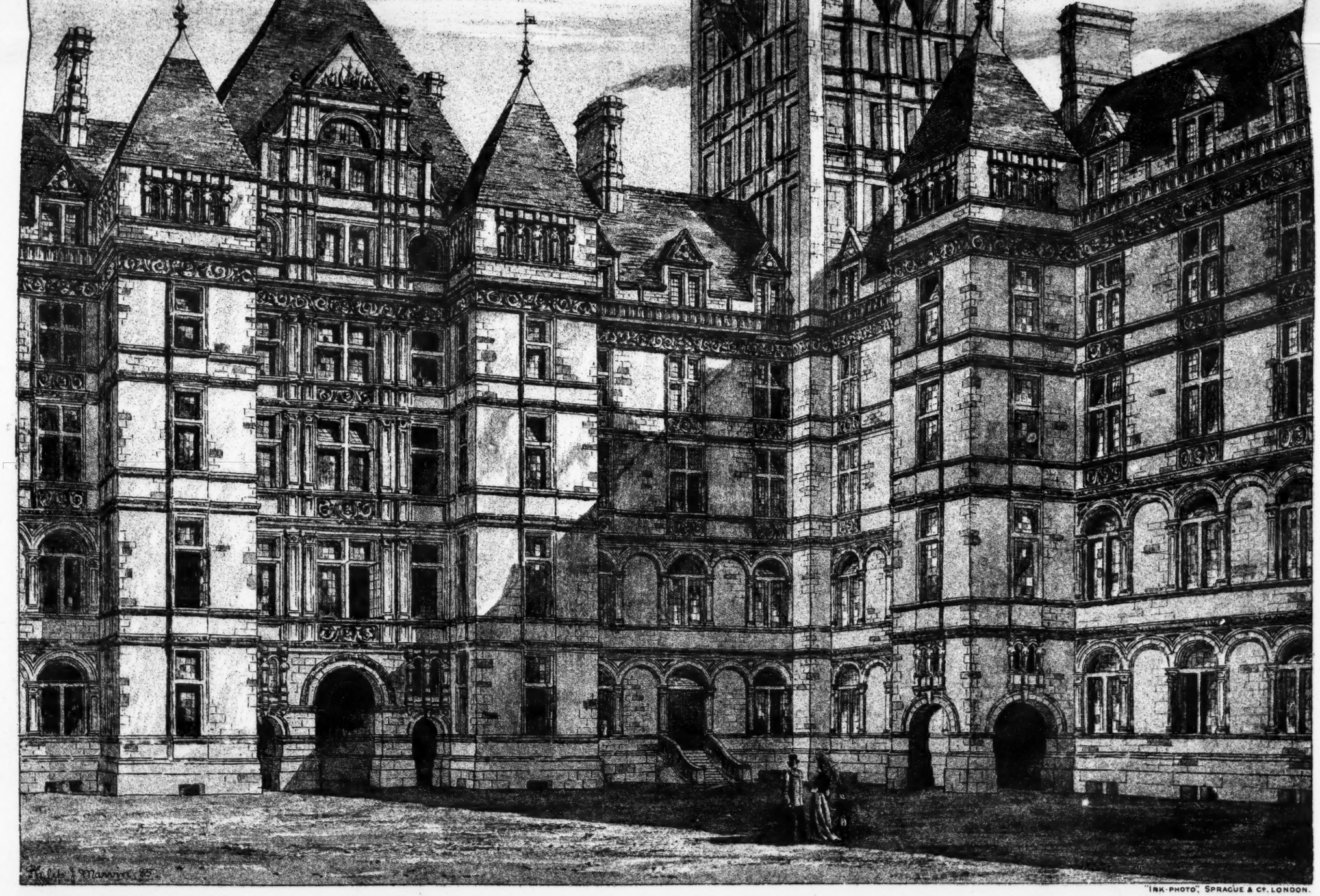
Even supposing that the remains were ample to the purpose of erecting similar buildings to those which once stood here, the question would arise,—"Is it desirable that such should be re-erected, and (by standing at the salient point of interest) catch the eye, to the utter detriment of that uniformity which a new front would at once and for ever realise?"

One of the best views, if not the grandest view, of the New Palace is obtained from a standpoint near the fountain. Any unbiassed person taking up this position cannot help seeing that the elevation between St. Stephen's Hall and New Palace-yard is extremely mean and undignified, and the erections to be added thereto will tend to increase this effect. At present there are only the massive buttresses, but when the cloisters are introduced the result will be to dwarf the Hall still more.

The restoration mania is now, it is to be sincerely hoped, nearly carried to its utmost limits. If such notions of preservation had entered the heads of our ancestors, we should have had little if any change of style. Repairing a twelfth-century building in the fourteenth would have resulted in dead twelfth-century instead of the then living style.

Take, for instance, the destruction of the Chapel of St. Mary, at the east end of the Abbey opposite. Henry VII. and Sir Reginald Bray did not hesitate to remove it to make way for the sumptuous resting-place of the former. Many other cases might be referred to where





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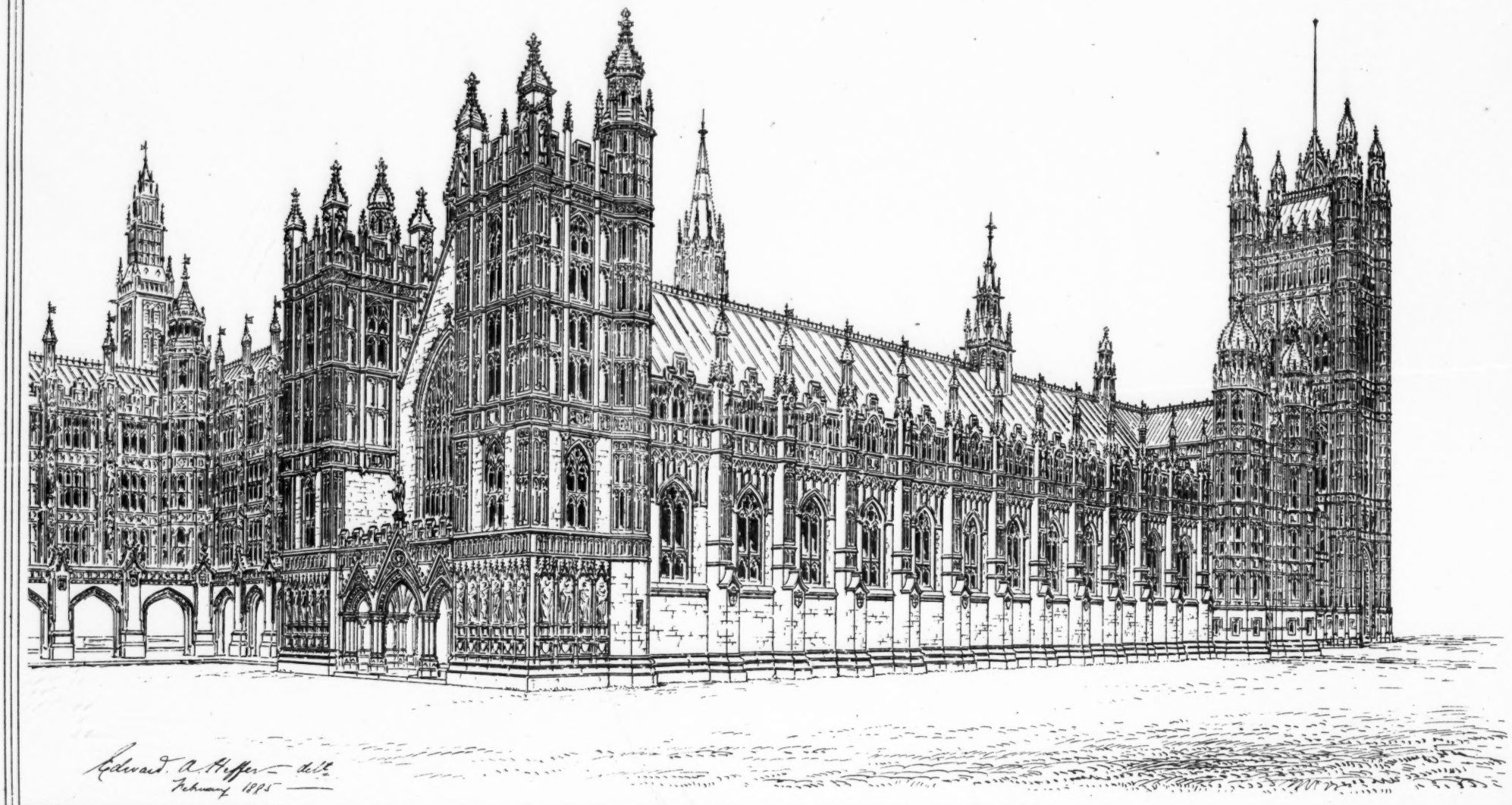
COMPETITION DESIGN FOR THE NEW ADMIRALTY AND WAR OFFICES, Mr. P. J. Marvin, Architect.

The Admiralty Court-yard.



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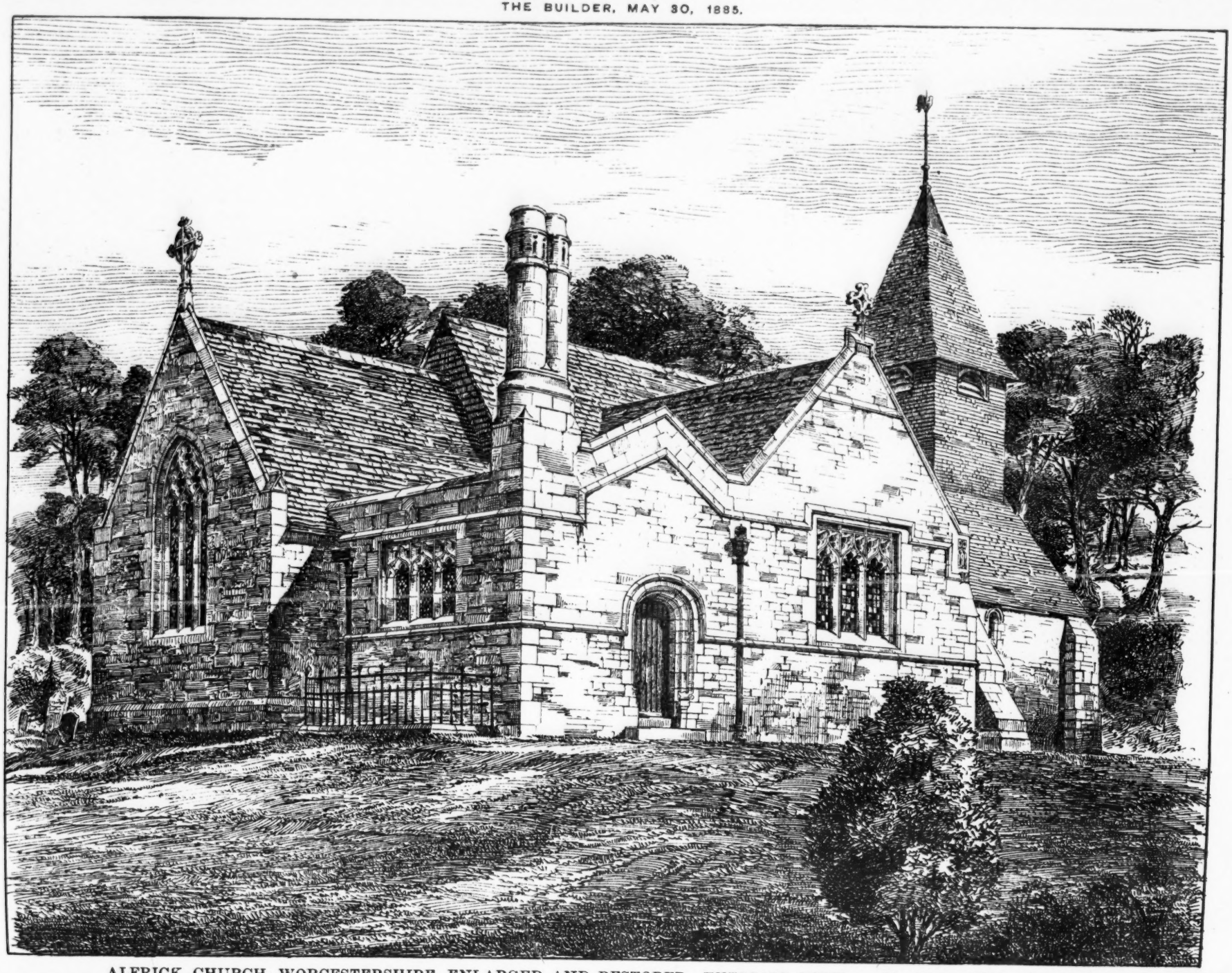
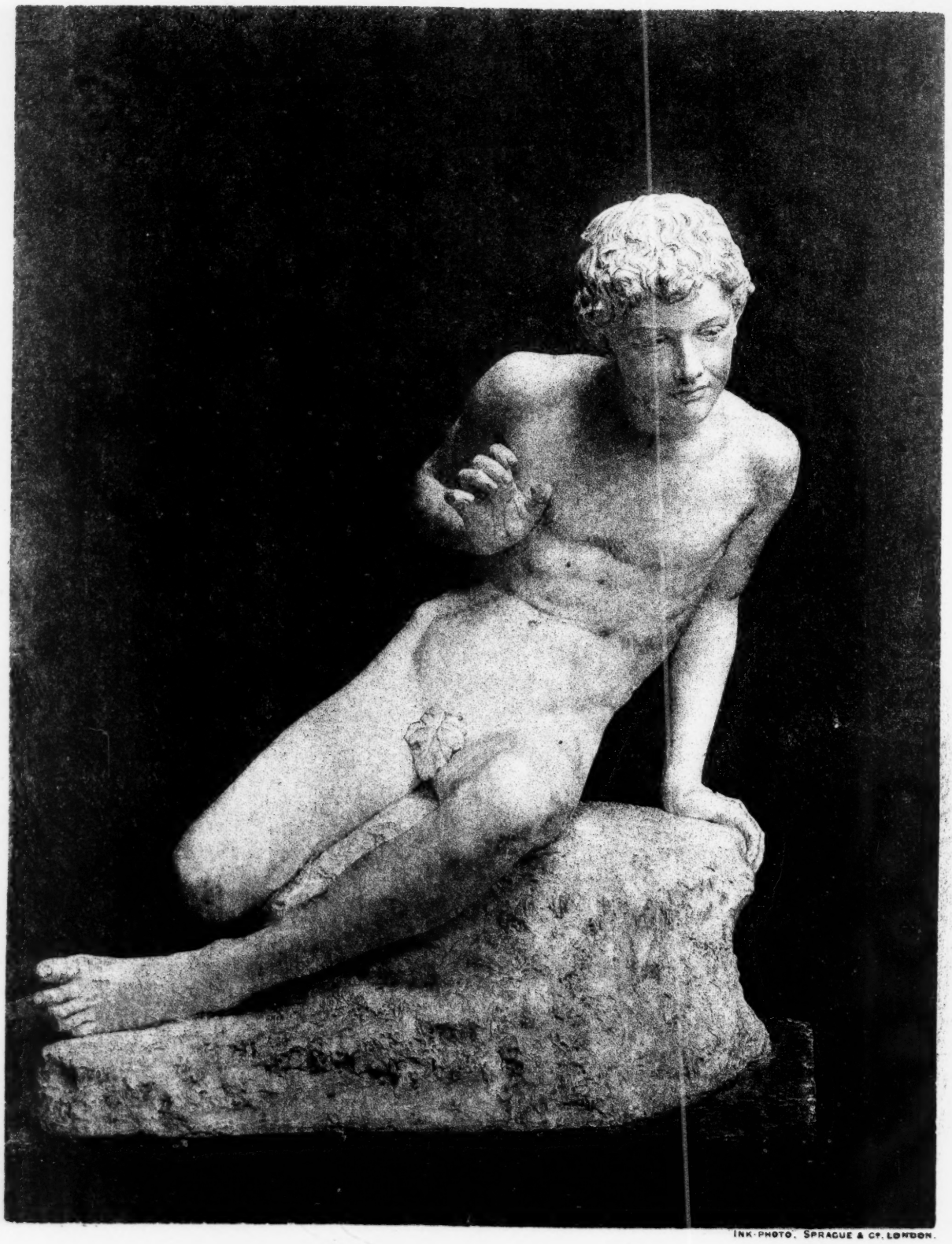
A SUGGESTION FOR THE TREATMENT OF THE WEST SIDE OF WESTMINSTER HALL, ASSIMILATING IT WITH THE STYLE OF THE HOUSES OF PARLIAMENT.—By Mr. E. A. Heffer, Architect.



ALFRICK CHURCH, WORCESTERSHIRE, ENLARGED AND RESTORED: EXTERIOR VIEW.——Mr. Aston Webb, Architect.



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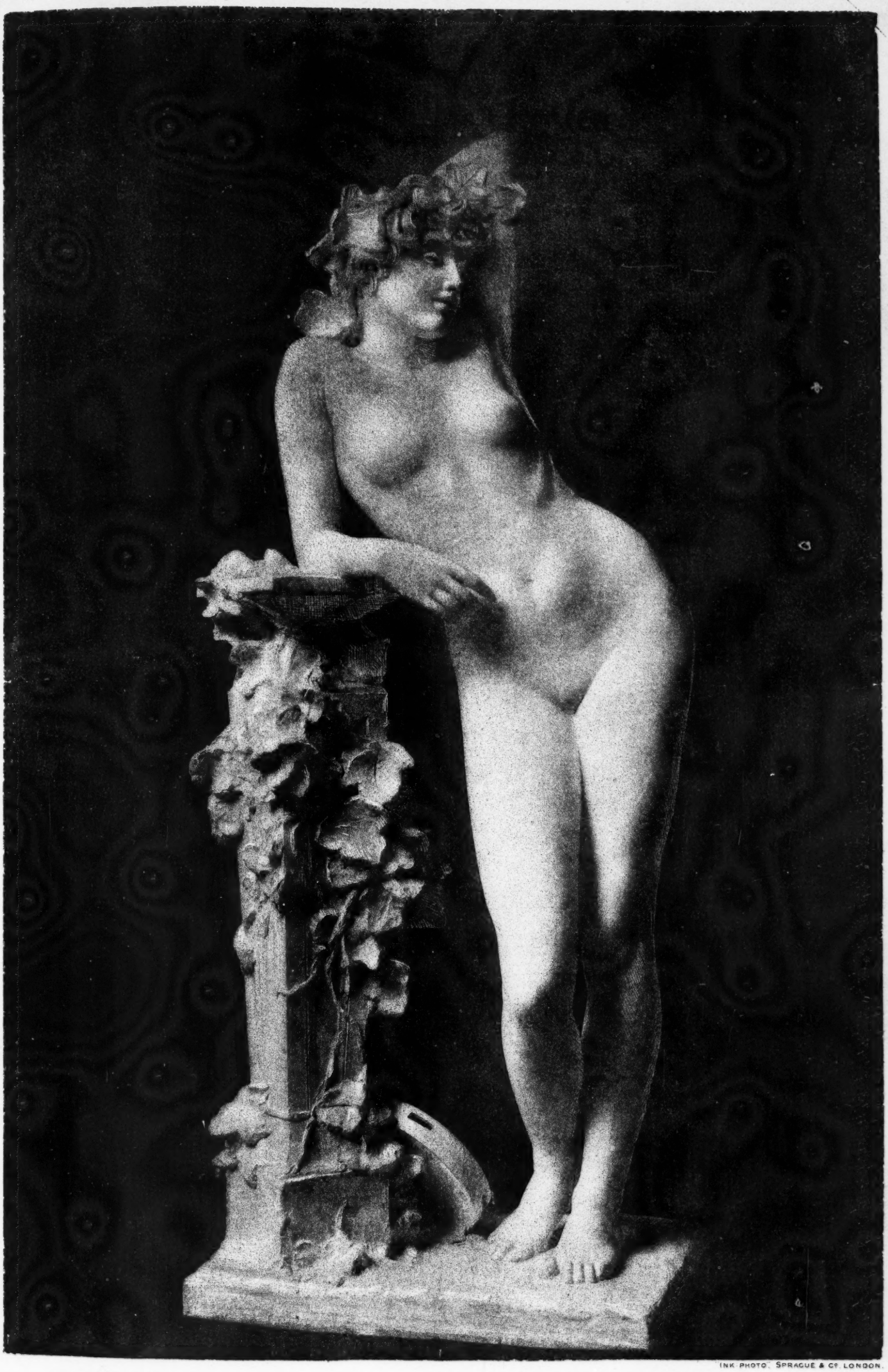
SCULPTURE AT THE ROYAL ACADEMY.

AUTOLYCUS,

"A SNAPPER-UP OF UNCONSIDERED TRIFLES."

MR. E. ROSCOE MULLINS, SCULPTOR.



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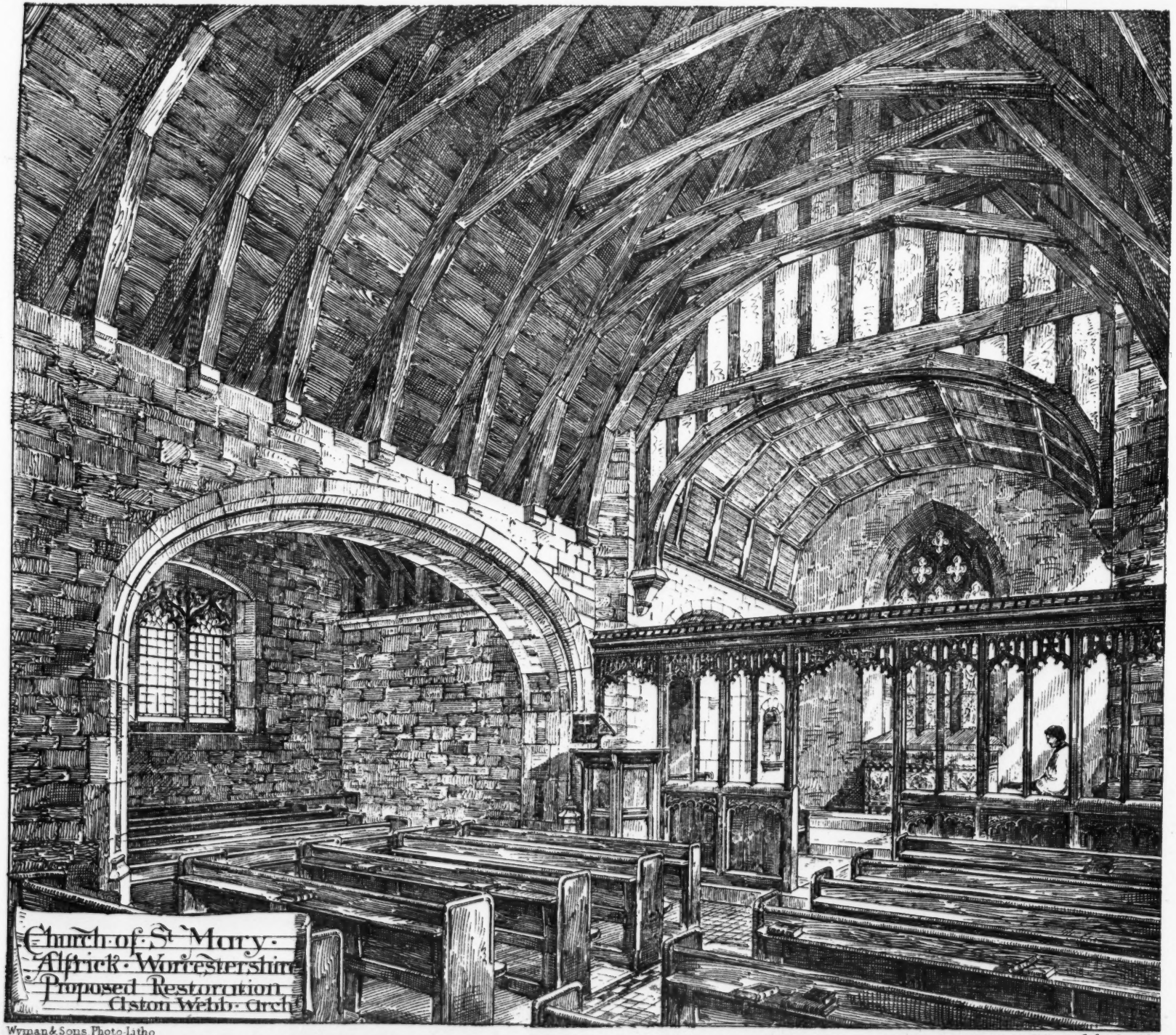
SCULPTURE AT THE ROYAL ACADEMY.

SPARTAN DANCING GIRL.

MR. G. A. LAWSON, SCULPTOR.



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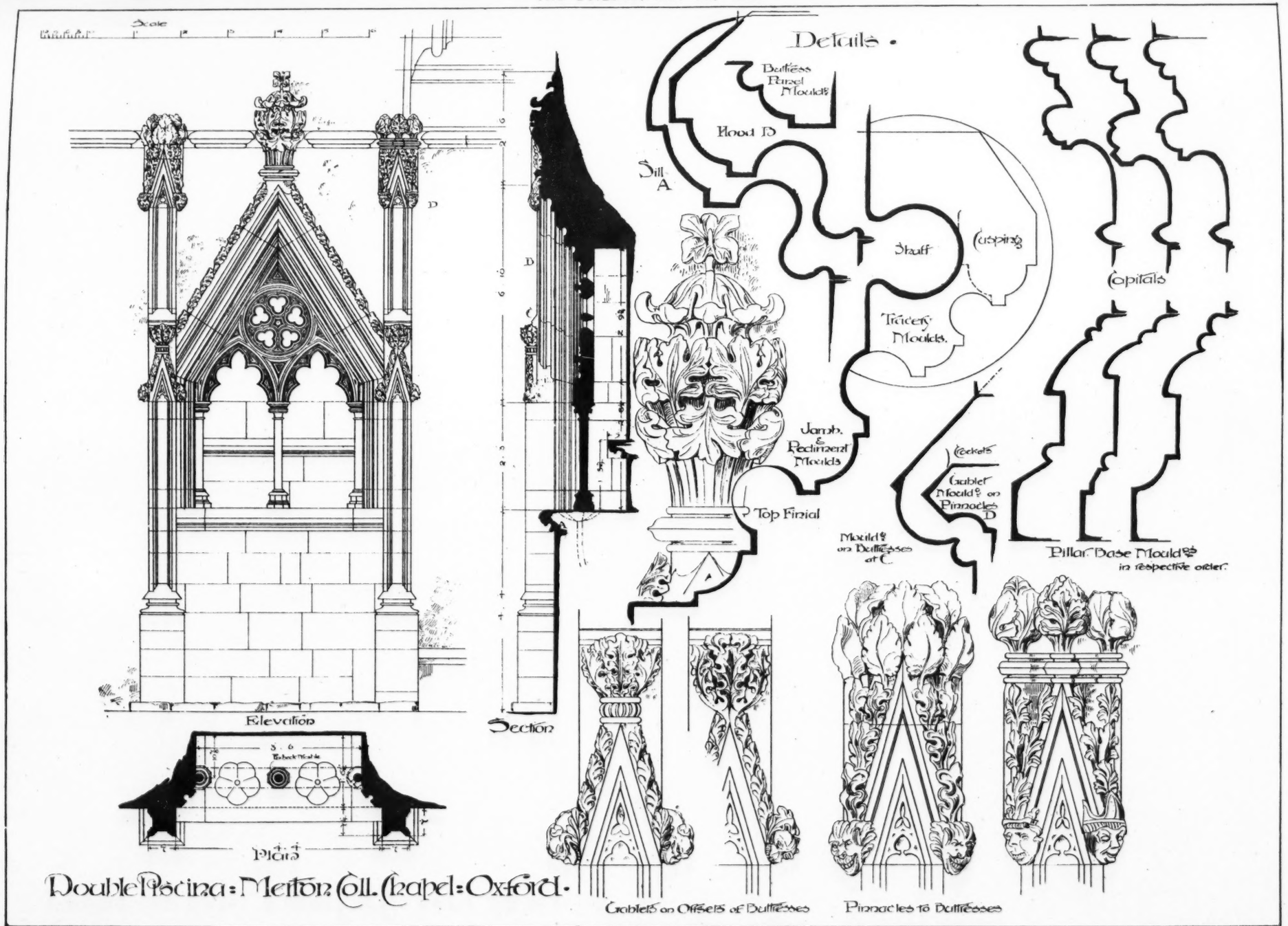


Wyman & Sons, Photo-Litho. *Measured and Drawn by* MR. H. D. WALTON. Ct Queen St London, W.C.

Architectural Association Travelling Studentship, 1885.

the exigencies and requirements of the times, rising above all misapplied sentiment (if any existed), led to new features and forms of architectural development.

The original idea of Sir Charles Barry to enclose New Palace Yard is, like all his schemes, grand enough, and worthy his genius; but I am inclined to think that by hiding the old Hall from the public, it would not be so satisfactory as retaining the open space, especially as the clock tower could not then be seen to such advantage as it is at present.

EDWARD A. HEFFER.

P.S.—Much more might be said on this burning architectural question of the hour. For instance, the unfortunate *low level* of Westminster Hall floor will be more apparent when the intended building is projected towards St. Margaret-street. The difference in the levels of the Hall and street will then be measured by the eye, and the result will be anything but satisfactory.

*** We give Mr. Heffer's design as an interesting and clever suggestion, conceived in a true architectural spirit, and therefore worth publication at a time when the subject is being discussed; not as necessarily endorsing it, or recommending its adoption. We believe, however, that he is correct in his surmise that the old flying buttresses do not in reality play any part in supporting the roof; and in regard to the general idea, there is no question that an architect of the late Mediæval period, if he had found the decayed buttresses left on his hands, and thought that he could do something better and more suitable himself, would have cut them away *without thinking twice about it*; and those who do not recognise that know nothing really of the spirit of the ancient architects whose works they profess to reverence.—ED.

DOUBLE PISCINA, MERTON COLLEGE CHAPEL, OXFORD.

THE beautiful double piscina stands at the end of the south transept of Merton College Chapel, and is of the same period (late thirteenth century) and style of workmanship as the sedilia in the chancel. The drawing from which the illustration is reproduced is one of a set for which its author, Mr. H. D. Walton, was awarded the Architectural Association Travelling Studentship for this year.

THE HÔTEL MÉTROPOLE.

THIS vast hotel opens for the reception of visitors on Monday next. The size and importance of the building are such as to demand some description at our hands. While there is a great deal of good work to be seen in the interior, and while the sanitary and other utilitarian arrangements appear to be well calculated to ensure the comfort and health of the guests and the easy and smooth working of what may be called the administrative service of the establishment, we greatly regret that externally the building is not, architecturally speaking, more worthy of its site. We certainly cannot agree with the encomium of one of the daily papers,—that the design of the elevation is "imposing;" it is anything but that. Making all allowance for the difficulties which beset the architects of such vast hotels,—for the necessity of piercing the façade with a countless number of windows, and for the necessity, from a commercial point of view, of utilising a very valuable site to an extent which would be incompatible with any material setting-back of portions of the building,—making allowance, we say, for all this, we cannot but feel that another great architectural opportunity has been lost. The design as a whole is common-place and the detail coarse, with the exception of the sculptured spandrels over the principal entrance in Northumberland-avenue, which have been executed by Mr. H. H. Armstead, R.A., and which allegorically represent "London." On the one side is a female figure with a shield containing the City Arms, with St. Paul's Cathedral in the background, while on the opposite side is a figure of "Father Thames," with shipping and the Tower of London in the rear.

Some of our readers may remember that two years ago* we called attention to the sham legislation which was supposed to give to the Royal Institute of British Architects the power to veto any designs for proposed buildings in Northumberland Avenue. At that time Sir James McGarel-Hogg, Chairman of the Metropolitan Board of Works, stated in the House of Commons, in reply to a question put by Mr. Story-Maskelyne, that "the design for the Hôtel Métropole was submitted to the Institute of British Architects, as required by the Act of Parliament, but after due consideration the Board did not think it necessary to put the tenant to the expense of carrying out the alterations suggested by the Institute, having regard to the fact that the plans* for the building had already been amended in accordance with the recommendations of the Board's Architect, who was himself then a member of the Council of the Institute." This reply seemed to us at the time to show (as we then remarked) such an extreme disregard for the requirements of an Act of Parliament that we turned to the statute,† where we found the following words, which, as it seemed to us, gave the Institute no power to interfere at all:—"The architectural elevations of all buildings to be erected under this Act . . . . shall be *submitted* by the Board to the consideration of the Council of the Royal Institute of British Architects previous to the commencement of any such buildings." The italics are our own, and the clause was shown to be a mere farce by the answer given to Mr. Story-Maskelyne by the Chairman of the Metropolitan Board of Works at a subsequent sitting of the House of Commons.‡ Sir James McGarel-Hogg admitted that the Board had received a letter from the Institute stating that "in the opinion of the Council, the design of the building, more especially as regards the ground-story, is unworthy of its intended position, and that the said design should be considerably modified before approval be given to it by the Metropolitan Board of Works"; but he contended that the Board had not evaded the conditions imposed by Act of Parliament, as suggested by Mr. Story-Maskelyne. "The wording of the Act," the Chairman of the Board went on to say, "was intended to convey no more than the suggestion of friendly consultation between the Board and the Council of the Institute, without binding the Board to carry out the suggestions of the Council." Without stopping to question the correctness of Sir J. McGarel-Hogg's interpretation of the intentions of the Legislature (which is certainly open to question), we hope that if in future our legislators are sufficiently enlightened to insist on some provision for ensuring tolerable buildings in prominent positions, they will profit by the lesson of the present *fiasco* and make the provision a reality and not a sham. We have recurred to this subject at some length because we feel that the lesson which it unfolds is one which ought not to be forgotten. But we now pass on to speak of the interior of the building, which contains a great deal of very satisfactory work.

The building occupies a site which, roughly speaking, is the shape of an isosceles triangle, the rounded apex abutting on the Victoria Embankment. The principal frontages are towards Northumberland Avenue and Whitehall-place, that towards the first-named thoroughfare being about 315 ft. long, and that towards Whitehall-place being about 312 ft. long. There is also a frontage of 140 ft. to Scotland-yard. The building also abuts for about 120 ft. on the offices of the Ecclesiastical Commissioners. The site is about an acre in extent, and the hotel is said to be the largest in Europe. The height of the building is 118 ft. from basement-floor to parapet in front of towers, and about 150 ft. to top of Mansards. Without counting the rooms in the Mansards, the building contains eight stories, with the addition of a *mezzanine* towards Whitehall-place. The ground-story, which is faced throughout with Portland stone, rests upon a grey Aberdeen granite base, but all the stonework above the first floor (except cornices, sills, balustrades, chimneys, and other exposed portions) is of Bath stone, from the quarries of Messrs. Pictor & Sons. The roofs are constructed of wood and iron, with every possible precaution against the spread of fire, such as Parian skirtings, window linings, &c., the only exposed woodwork being the doors, and roofed for the greater part with zinc tiles.

The basement, which is 15 ft. high, and well lighted, contains two large billiard-rooms, two smoking-rooms, a servants' dining-hall, boiler-house, machinery rooms, lavatories, hair-dressing department, large wine-cellars, workshops, &c. The ground-floor contains, on the side facing towards Northumberland-avenue, the grand *salle à manger*, 105 ft. long by 45 ft. wide and 25 ft. high, and extending from the vestibule and entrance-hall in Northumberland-avenue to the Scotland-yard corner of the building. This fine apartment is divided upinto spaces resembling the nave and aisles of a church by two rows of columns with Corinthian capitals with marble pedestals, supporting massive girders which carry the division-walls and corridors of the superstructure. To the left of the great entrance-hall is a large lobby, giving access to the grand staircase and lifts for passengers and luggage; to a reception-room, 47 ft. 6 in. by 33 ft.; and to a corridor giving access to another vestibule, Moorish in style, from which the library and drawing-room are entered. The library is 34 ft. 6 in. by 27 ft., occupying the corner of the building at the junction of Northumberland-avenue and Whitehall-place with the Embankment, the drawing-room, a very fine apartment, measuring 50 ft. by 40 ft. A good portion of the corner of the ground-floor frontage to Whitehall-place is occupied by bedrooms with a corridor between them, the rooms on one side of the corridor looking on to and being lighted from the street, and those on the other side getting light from the light-courts in the interior of the building. Owing to the great height of the principal apartments on the ground-story towards Northumberland-avenue, it has been easy to get in a *mezzanine* floor towards Whitehall-place, and this is also devoted to bedrooms. The bedrooms on the ground-floor and *mezzanine* extend along the Whitehall-place frontage as far as the Whitehall-place entrance, the vestibule of which gives access to a secondary entrance-hall and staircase. To the left of this entrance-hall is the large Banqueting Hall, or "Whitehall Salon," about 80 ft. long by 42 ft. wide, with a circular bay at the Whitehall-place end. At the inner end of this hall is an elliptical recess or alcove for a daïs; this alcove is top-lighted, and is decorated with some paintings by Mr. C. J. Durham, hereafter referred to. Beyond this hall, and lighted on one side by an intervening light court and on the other side by windows looking on to Scotland-yard, is a large public dining-room, about 44 ft. by 36 ft. The remainder of the Scotland-yard portion of the ground-story is occupied by the service entrance and stairs, by still-room, serving-room, pantry, &c., with the necessary lifts, and other accommodation. Behind these rooms, and approached from the grand *salle à manger* and from the great entrance-hall, is a secondary *salle à manger*, called the Oak Salon, and measuring 49 ft. by 44 ft. This apartment, as well as an adjoining one (which is to be used as a private dining-room, and is to be known as the King's Room,—44 ft. by 22 ft., with a recess or alcove on one side), are top lighted from the larger of the four light-courts, through stained-glass soffit lights. Carried up in the centre of the building, between two of the light courts, is what may for convenience be called the sanitary block, containing water-closets, baths, &c., so that every water-closet has a window opening to the external air. The first and second floors are mainly occupied by bedrooms, some of which have sitting-rooms and dressing-rooms *en suite*. Each *suite* of private apartments is provided with its own bath-room and water-closets. The third, fourth, fifth, sixth, and seventh floors are nearly all taken up by bedrooms and sitting-rooms, of which the total number is between 500 and 600. The kitchen is on the fifth floor, and is very large and lofty. It is top-lighted. Adjoining is a large bakery.

Having now described the general arrangement of the building, we proceed to give a few details of its constructive and decorative features. The foundations are of Portland cement concrete, carried down in some parts (especially where the site covers ground reclaimed from the river by the Embankment works) to the extent of 35 ft. below the pave-

* See *Builder*, May 19, 1883, p. 636.

* We understand that what is meant by this word is "designs" or "elevations." We believe that the only alterations made in the design by Mr. Vulliamy consisted in the deletion of some of the windows and in carrying up coupled pilasters instead of single ones in those parts of the elevations under the Mansards, so as to broaden and emphasise the design to some extent at intervals; and no doubt, so far as it goes, this is an improvement.

† The Charing Cross and Victoria Embankment Approach Act, clause 30.

‡ See *Builder*, June 9, 1883, p. 797.

ment level. The footings are extended, and the walls are built in Portland cement up to the cills of basement, with about forty miles of stout iron hooping, 2 in. wide, embedded therein. The whole of the remainder of the structure is built with blue lias ground lime. Nearly all the bricks used in the building are the excellent light red bricks from the Ellistown works, near Leicester. Staffordshire blue bricks are used for piers and in other positions where great weights have to be borne. The light courts are all faced with the excellent white glazed bricks supplied by Messrs. Cliff & Sons, of Wortley. As a large number of flat-headed window-arches had to be put in, specially-made skewbacks of the same material were made, so as to save labour in cutting to form the abutments. The two principal staircases, which go from top to bottom of the building, are of fireproof construction, and are on the same principle as those constructed at the Grand Hotel and at the First Avenue Hotel, by Mr. Holloway, and which has been previously noticed by us in terms of commendation. They are of concrete, made of Portland cement and coke breeze, stiffened with iron internally, the treads and risers of the grand staircase being of marble up to the second floor, and those of the secondary staircase, near the Whitehall entrance, being of oak up to the first floor. The soffits of these staircases are panelled and very nicely moulded and finished in Parian cement. The service stairs, which go from top to bottom of the building, are of hard York stone. The corridors (of which there is a total length of 1¼ mile, and which have also been designed by Mr. Holloway), have their floors and side walls, from top to bottom of the building, constructed of fireproof concrete of the description before referred to, and the ground and first floors, and all the kitchens, bakery, &c., on the upper floor, are of fireproof construction throughout, on Dennett's system. The floors of the grand *salon* and of several other of the larger apartments in the building are of cement and coke breeze laid on top of the concrete. This makes a capital flooring surface where it can be carpeted. The same material forms the floor of all the corridors. Down the centre of each corridor runs a channel for the passage of gas-pipes, electric light and electric bell wires, &c. All the corridors will be covered with a thick felt carpet, so as to deaden the sound of footsteps, and so ensure quietude. In the upper floors the skirting-boards, window-linings, &c., are all executed in Parian cement, so as to reduce the amount of exposed woodwork to a minimum. Other precautions against the spread of fire are seen in the hydrants which, always fully charged with water, occur at frequent intervals in the corridors. There are about 1,100 tons of constructional ironwork in the building, all of which has been supplied by Messrs. Handyside & Co., of Derby, including some steel girders used to span the banqueting-hall, or "Whitehall Salon," as it is to be called, and which, by the way, has a very good oak floor, so that it may be used as a ball-room. Architecturally-speaking, the interior of this room, which is Renaissance in style, is perhaps the least satisfactory of all the large interiors. The detail exhibits one or two anachronisms, which we will not stop to point out now. Before going on to speak of the artistic effect of the interiors, however, we must say a word or two in praise of the ingenuity and skill exhibited in the planning, which reflects great credit upon its authors.

The building exhibits the practical working-out of several valuable "notions," as our American cousins would call them, for the saving of time, labour, and inconvenience, and so maintaining internal economy of administration. One of the most interesting of these are the "hot-water and boot boxes" provided in connexion with all the bedrooms. This, we believe, is the result of a suggestion made by the managing proprietor of the establishment, Mr. Gordon, and it has been very well worked out by his builder. In the corner of each bedroom nearest the door is a wooden pedestal covered with a hinged lid. By lifting up this lid the occupant of the room can deposit his boots in a receptacle about 12 in. deep. Access to this receptacle is obtained from the corridor by a small door, on opening which the chamber-maid can remove or replace the boots of the occupant of the room, or can deposit a can of hot-water. By this means not only is the convenience and privacy of the occupants ensured, but the corridors are not littered, as they often are in other establishments, by cans of water and "too, too many pairs of shoes." Another admirable contrivance which is likely to be appreciated by the chamber-maids, at any rate, consists of a small semaphore signal which will be raised outside each room whenever the occupant touches the "push" of his electric bell. In a building of this extent the corridors are necessarily of some considerable length, and it is often likely to happen that when the chambermaid is at the end of the corridor remotest from her room she may hear the bell of the numbered indicator. Now without the aid of the small semaphore raised outside each room when its bell is rung, the maid would frequently have to traverse the length of the corridor to look at the indicator and then to return possibly to the remotest end of the corridor to the room where her services were required, instead of being able, as she will be by its aid, of at once seeing where she is wanted. Among other contrivances likely to be conducive to the convenience of visitors may be mentioned the bolts of the water-closets, which when fastened on the inside automatically display on the outside the word "engaged."

Tanks in the upper part of the building give a water-storage capacity of 30,000 gallons. There are two hydraulic lifts for passengers, working side by side, but independently of each other, in a square space enclosed by the grand staircase. These lifts work in a strong and well-designed framing of iron columns and stays. In order to obviate the unsightliness of the greasy guides and rams, and to partially conceal the cages in their ascent or descent, Mr. Holloway has, inspired by a happy thought, devised and worked out a method of filling in the iron-framed enclosure containing these lifts with perforated sheet zinc panels. The perforations consist of well-designed flowing arabesque patterns, and being gilded on the external face, and divided by mouldings of dark-coloured wood, this metal screen has a very rich effect, according well with the rich marbles with which the walls of the staircase, hall, and vestibule are lined and decorated. Mr. Holloway has also adopted in this building the method which he devised for the admission of fresh air (warmed when necessary by steam pipes) into the larger apartments of the Grand Hotel and other buildings with which he has been connected. In the grand *salle à manger* of the Hôtel Métropole, for instance, the fresh air is admitted through the tops of the pedestals of the columns which divide that apartment longitudinally. The bedroom sashes are all provided with a simple ventilator invented by Mr. Alfred Holland, the manager of the Grand Hotel, which we described a year or two ago, and which is called the "Lazy" ventilator.

We have only a small space in which to speak of the decoration and character of the principal apartments of this monster *caravanserai*. The large dining-hall or grand *salle à manger* is Italian in style, with marble dado and pilasters, and richly-decorated ceiling and walls. The smaller dining-hall, or Oak Salon, is panelled in oak. It is Renaissance in style, and devoid of elaborate detail. The walls contain large panels filled with French hand-woven tapestry. A rich frieze of Lincrusta-Walton, of bold design, surmounts the oak panelling. Adjoining is the "King's Room," which is lined with oak of a darker colour than that of the Oak Salon. It is Jacobean in character, and is more elaborate in detail than the room last mentioned. There are portraits of King James I., and of Raleigh, Bacon, Ben Jonson, and other celebrated men of hat reign. These are painted in oil, and are he work of Mr. Albert W. Holden. The Whitehall entrance and staircase are treated entirely in oak, and are Renaissance in character. The Whitehall Salon, otherwise known as the Banqueting Hall, is Italian in style. In the alcove at the inner end of the hall are three paintings executed by Mr. C. J. Durham, representing scenes at an Italian marriage festival. This hall and some of the adjacent rooms have been temporarily retained by the Junior Carlton Club during the rebuilding of part of their premises in Piccadilly. Close to the grand staircase is the Reception Room, decorated in the Italian style. The tapestry in the four panels has been specially made at the Royal Windsor Tapestry Works, and represents views of the royal palaces. The *amorini* or cupids in the frieze have been painted by Signor Cordeña, a Spanish artist, while the birds, flowers, and smaller panels with cameo centres (after those in the Gallery of Apollo in the Louvre) have been painted by M. Monblond. The library, adjoining, is a fine oak-lined apartment, Elizabethan in style, panels of embossed leather being introduced. There is a boldly-designed plaster-frieze above the panelling, the ceiling being of oak. The vestibule adjoining is Moorish in style, and contains a great deal of costly work, imported from the East. The drawing-room is a richly-decorated apartment in the Louis Seize style, the decorations being after those in the Salon Rose at the Tuileries. The hand-painted silk panels, representing musical trophies, with cameo medallion portraits of celebrated composers, have been executed by M. Monblond, who was employed on similar work at the Tuileries. Among other noteworthy apartments in the building is the Marie Antoinette chamber, on the first floor, which is stated to be an exact copy of Marie Antoinette's boudoir at Fontainebleau. The painted panels in this room were specially executed for Messrs. Maple & Co. by M. Galland, a well-known Parisian artist. Altogether the furnishing, upholstery, and decoration, which have been in the hands of Messrs. Maple & Co., reflect great credit upon that firm. The furniture, so far as we saw, is good in design and execution, and there is a pleasing variety of it, no two rooms being precisely alike either as to furniture or decoration.

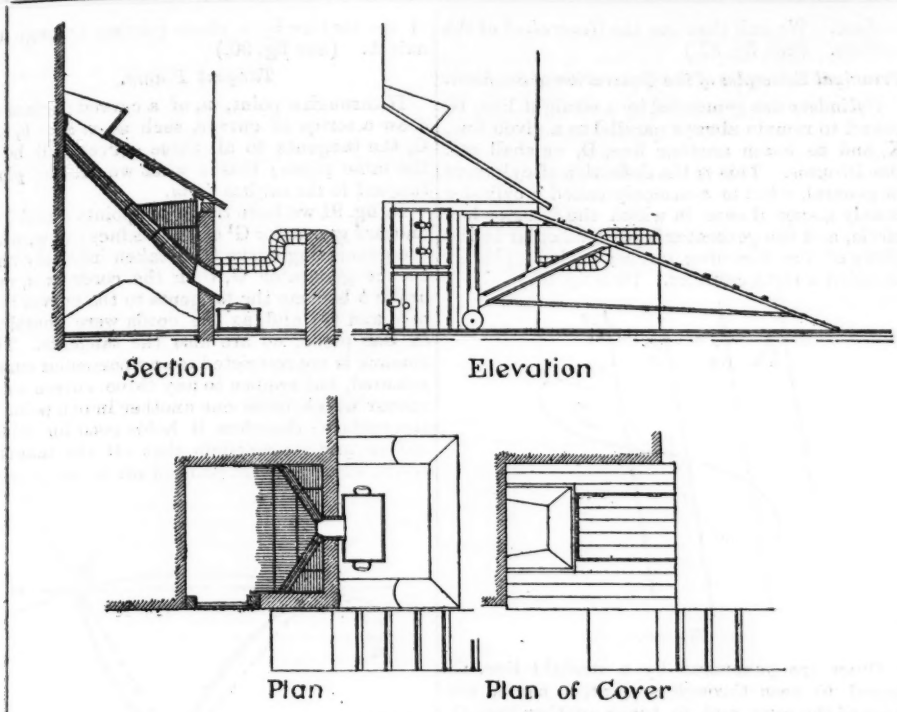
The whole of the structure has been carried out by Mr. G. H. Holloway, as builder for the proprietors (no contractor being employed), and under his personal supervision and direction. He has been ably assisted by Mr. W. Spencer, who has had charge of the preparation of the joiners' work (all of it which we examined being very satisfactory), and by Mr. Parnall, who has acted as general foreman. The architects of the structure are Messrs. F. & H. Francis and J. E. Saunders. The entire furnishing of the building has been carried out by Messrs. Maple & Co., who also fitted and decorated the drawing-room, library, reception-room, the oak *salon*, the king's room, the Whitehall entrance, the grand *salle à manger*, and Whitehall *salon*. All this firm's work is characterised by great excellence. The marble and mosaic work is by Messrs. Burke & Co. The decoration in the grand entrance vestibule and staircase is by Messrs. Clayton & Bell, who also executed the stained glass throughout the building. The stonework and carving are by Mr. F. G. Anstey. The constructional ironwork is by Messrs. A. Handyside & Co.; and the iron balustrading of the principal staircase by Messrs. Braun, and Messrs. Richardson & Ellson; that of the Whitehall staircase is by Messrs. Sanson & Co. The hot-water service and kitchen fittings are by Messrs. Benham & Sons. The sanitary appliances and baths are by Mr. George Jennings. The passenger and service lifts are by the Hydraulic Engineering Company, of Chester. The electroliers are by Messrs. B. Verity & Sons. The gas mains and fittings throughout the building are by Messrs. Hulett & Co. The outside lamps and self-regulating burners are by Messrs. Sugg & Co., Limited. The zincwork is by Messrs. Braby & Co. The art-tile work is by Messrs. Simpson & Sons, and Messrs. Wilcock & Co., of Burmantofts, Leeds. The locks are by Messrs. Hobbs, Hart, & Co.; the bricks by the Ellistown Brick Company, and Messrs. J. Cliff & Sons; the fireproof floors by Messrs. Dennett & Ingle; the graining by Mr. Osmond; the fire appliances by Messrs. Merryweather & Sons; the electric bells by Messrs. Adams & Sons. The basements are illuminated by daylight, as far as may be, by means of Hayward's patent prismatic pavement lights.

The following are a few statistics as to the materials, &c., used in the construction of the building, the cubical contents of which are upwards of 5,000,000 ft., viz.:—

88,750 ft. cube of stone; 6,617,000 bricks; between 30 and 40 miles of hoop iron; between 8 and 9 miles of 2½ in. by ½ in. bond iron; 151,750 ft. cube timber; 1,100 tons constructional ironwork; 1½ mile iron channelling; 19 miles lathing, 1 yard wide; 5½ mile cornices; 5½ miles skirting; 1½ mile length of corridors;* 42 miles electric bell wire; between 6½ and 7 miles gas barrel; 5 miles electric-light wire; 400 squares of roofing.†

* The corridors are taken above the ground-floor to the seventh floor inclusive.

† These figures only give the materials used up to December 31st last, so that in some instances they have now been largely exceeded.



An Improved Dust-bin.

DUST BINS.

As this subject is now attracting attention elsewhere, we give a plan, section, and elevation of a dust-bin, from a model kindly lent to us by Mr. T. W. Erle, who has employed this arrangement at his own house. Mr. Erle writes:—

"The cinders, &c., as will be seen, are shot into the funnel at the top, and screen themselves by 'racing' down the wires, which are fixed. If the wires were movable, there would be a risk of their being taken out by some perverse slut, and of all sorts of putrescible refuse being thrown into the receptacle. The folding-doors prevent any dust from rising. The essential point of any good arrangement for the screening of the cinders is that it should be, as in this case, self-acting; that is to say, that it should give no trouble whatever. The ashes are removed by a shovel through the lowest door at the side. The smaller doors above this are for putting in broken crockery or other such things, which would not pass through the sieve, but would be out of place amongst the cinders. Two doors are more convenient for this purpose than one. Usually it is only necessary to open one. If any wet refuse were to be shot into the funnel, it would clog the wires, and would have to be picked off by hand. To introduce, by hand, any such refuse through the small doors at the sides would be a troublesome and unattractive process. According to my experience, it is never done; but if it were, I should fasten up the doors at the side (excepting the one at the bottom, which it would be impossible to misuse), and have broken hardware, &c., put at the side of the dustbin.

The slope, as will be seen, is easily moved away in a moment when access to the doors is required. Any girl can do this."

BUILDERS' BENEVOLENT INSTITUTION.

AN election of pensioners on the funds of this Institution took place at Willis's Rooms, St. James's, on Thursday last, Mr. Stanley G. Bird, President, in the chair. There were three vacancies,—two for men and one for a woman, and there were five candidates, of whom four were men. The following is a list of the candidates, with the number of votes polled for each, according to the report of the scrutineers (Messrs. Geo. Plucknett, J.P., and Thos. Stirling), viz.:—John Richmond Bisley, Bermondsey, aged 74, builder (third application), 933 votes; Reuben Hurren, Notting-hill, aged 66, builder (third application), 1,170 votes; James Robert Rawley, Kingsland (formerly a subscriber to the funds of the Institution), aged 64, plumber, &c. (second application), 1,588 votes (including 20 allowed for subscriptions); and Wm. Thornton, New Wandsworth, aged 66, builder (second application), 676 votes. Mrs. Caroline Harrison, of Lisson-grove, widow of Matthew Harrison, being the only candidate for the female's pension, she was elected, as a matter of course.

The Chairman declared the successful candidates to be James Robert Rawley, Reuben Hurren, and Mrs. Caroline Harrison.

A vote of thanks to the Chairman, moved by Mr. Plucknett, and thanks to the scrutineers and other gentlemen who had taken part in the proceedings, brought the meeting to a close.

OBITUARY.

M. Théodore Ballu.—The death is announced at Paris of M. Théodore Ballu, one of the architects of the Hôtel de Ville, who died on Friday morning of a malady from which he had been suffering for some little time past. He was born in 1817, and was a pupil of Hippolyte Lebas at the School of Fine Arts, where he succeeded in gaining the Grand Prix de Rome for architecture. Upon his returning from the Villa de Medici, and after a visit to Greece, he completed the Church of St. Clotilde, which had been commenced by Gau. Among his subsequent works may be mentioned the Churches of the Trinity and St. Ambroise, as well as the restoration of the tower of St. Jacques de la Boucherie and the Church of St. Germain l'Auxerrois. In 1873, when the Municipal Council opened a competition for the reconstruction of the Hôtel de Ville, he participated in it in collaboration with M. de Perthes. They gained the first prize, and were charged with the execution of the great work, to which he devoted all his powers.* M. Ballu, who was a Member of the Institut de France and Inspector-General of Diocesan Edifices, was elected as an Honorary and Corresponding Member of the Royal Institute of British Architects in 1876.

TEMPLE BAR GATES.

SIR,—Can any of your readers inform me whether there is truth in the report that the carved wooden gates which once adorned Temple Bar have been allowed to lapse into decay? If so, it would be curious to know who is responsible for this neglect.

OLD LONDON.

YORK HOUSE WATER-GATE.

SIR,—May I offer a suggestion as to the preservation of this beautiful relic of the taste and skill of Inigo Jones, which is now almost lost, and utterly useless in its present position?

Why not remove it to the west end of the ornamental water in St. James's Park, opposite Buckingham Palace, where it would be seen to the greatest advantage from all points, and where it might even be restored to its original use, namely, a gate from whence to embark in boats on the water?

If, however, objection should be taken to this latter part of the proposal, the gate would still remain an elegant ornament to the margin of the west end of the lake. The cost of removal of so small a structure need not be a very heavy item.

G. BYNG GATTIE.

* The following illustrations of this building have appeared in the pages of the *Builder*, viz.:—External view, vol. xxxix., 1880, p. 328; interior view, Hall of Fêtes, vol. xliii., 1882, p. 402; and Council Chamber, vol. xlv., 1883, p. 463.

A QUESTION OF VALUATION.

SIR,—I shall be greatly obliged if some kind friend and reader of the *Builder* will give me replies to the following questions at the earliest possible date, viz.:—What is the *present* value of a tithe-rent charge, commuted at 11*l.*, payable annually? Also the present value of a land-tax assessed at 9*l.* the year?

ONE IN A FIX.

PROVINCIAL NEWS.

New Brighton.—At this watering-place, at the mouth of the Mersey, a "Palace" and Winter Garden have been formed containing a large room for entertainments, 198 ft. long by 104 ft. wide in the centre, and 25 ft. high throughout. The walls are built in brick, with brick in cement piers, and the whole area is covered with a flat compound iron and concrete roof or floor, which is (average) 7 in. thick, having but 2 in. fall each way from the centre over the entire area, with a water outlet at the four corners. This roof and floor is carried upon cast-iron columns in bays, 30 ft. 6 in. by 22 ft. 6 in., upon brick in cement piers about 16 ft. below the floor-level, upon a foundation of concrete below ebb tide. Over the 30 ft. 6 in. span between column and column in the width of building, rolled compound riveted girders, 2 ft. deep, stretch from side to side, supporting 12-in. girders which run the length of the room, and over all transversely are rolled joists, which are embedded in concrete, finished with Seyssel asphalte rock. This portion of the contract has been executed by Messrs. Homan & Rodgers, of Manchester and London; and the internal plastering of walls and ceilings by Messrs. Tanner & Son, of Liverpool. A grand organ fills one end of the room, and the floor is laid with pitch-pine for dancing; the flat roof over is used for the same purpose and for skating, and constructed to carry a moving weight of 2½ cwt. to the foot, and was tested before use with a slip gauge below, and some hundreds of weighted bags of sand on one bay, and a body of workmen. The deflection was three-tenths of an inch on the 22 ft. 6 in. girder, which went back to the normal position after the weight was removed, and the whole has been thoroughly tested by crowds from time to time without producing the slightest crack in the ceilings below. From this room to the right are small concert-halls, aviaries, grotto, and other entertaining rooms, and on the left is a promenade conservatory, 135 ft. long by 59 ft. 6 in. wide filled with beautiful exotics and surrounded by vineries and azalea and camellia houses, the whole being warmed with some 1,000 ft. of hot-water pipes. These buildings have been executed under contract by Messrs. McKenzie & Moncur, of Edinburgh; and the cement floors and tiled pavement by Mr. R. Lowe, of Farnworth. The dancing area, being about one acre on floor and roof, is brilliantly lighted at night by gas and electricity. The whole has been designed and carried out under the personal superintendence of Mr. T. C. Ebdy, architect, of Birkenhead. Upwards of 60,000*l.* has been spent on the undertaking.

Toxteth Park, Liverpool.—The alterations to the offices of the Toxteth Park Local Board, situate in Lark-lane, Toxteth Park, Liverpool, have just been completed by the contractor, Mr. John Carruthers, of Toxteth Park, from the designs of Mr. John Price, Assoc. M. Inst. C.E., engineer and surveyor to the Board. The cost, including some fittings and furniture specially designed, has been 450*l.*

Bolton.—Mr. Jonas Proctor, M.Inst. C.E., having resigned his appointment as Borough Surveyor to the Bolton Corporation, has commenced private practice, and taken into partnership Mr. H. L. Hinnell, formerly his pupil, and late of the Borough Engineer's Office, Nottingham. Mr. Proctor has been retained by the Bolton Corporation to complete the Hacken Outfall Sewage Works, for the Borough and Rural Sanitary Authority.

Rochdale.—The new premises of the Manchester and Liverpool District Bank, which have just been opened for business, are situate at the corner of Hind Hill-street and Market-street, in the side space just opposite St. Luke's Church. The building faces both streets, the bank entrance being at the corner, and is Classic in style. The banking-room is spacious and well lighted. The safe is made of steel, and surrounded with thick concrete, and approached by double fireproof doors by Messrs. Chubb. This

safe contains another of Messrs. Chubb's patent cash safes. Attached to the bank is a manager's house. The whole of the place is heated with hot water, and great care has been bestowed upon the ventilation, both as to the admission of fresh air and the extraction of foul air. The premises have been designed and carried out under the superintendence of Messrs. Maxwell & Tuke, architects, Manchester and Bury, by Messrs. Diggle Bros., of Heywood. The block floors and ceramic tile work have been done by Mr. L. Oppenheimer, of Manchester; the hot-water by Mr. J. Downham, of Bury; the grates by Mr. John Kershaw, of Heywood; and the bank fittings by Messrs. Beahans & Company, of Manchester.

The Student's Column.

DESCRIPTIVE GEOMETRY.—PART II.

I.

OF SURFACES IN GENERAL.

Curved Lines and Tangents.

ALL curved lines can be exactly represented by two projections. They belong to two distinct categories. Firstly, *plane lines* or lines which are entirely contained in planes, such as a circle for instance; secondly, *lines of double curvature*, which are not contained in planes, such as the thread of a screw.

The *tangent* to a curve in any point is the *limit* of the direction of the cords which join that point to another point infinitely near to it. We conclude thereby that the projection of a tangent is also tangent to the projection of the curve; for, if on curve C we draw the cord $a\ b$, we see that when the point b nears a so will b^h near a^h in the projection, and when b becomes infinitely near to a so will b^h be infinitely near to a^h; and the cord $a^h\ b^h$ prolonged will be tangent to the projection C^h in the same time as the cord $a\ b$ becomes a tangent to the curve C itself. (See fig. 86.)

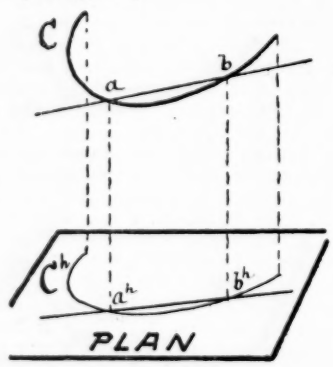


Fig. 86.

The use which is made of infinitely small dimensions and the notion of limits belong to the higher grades of mathematics, such as differential and integral calculus, and may seem strange to some students; but, in this second part of Descriptive Geometry we cannot escape using them also, and the student should do his best to grasp at once these ideas in the above simple example.

Generation of Surfaces.

All surfaces can be engendered by the motion of a line either of constant or variable form. For instance, suppose we cut a surface by a series of parallel planes infinitely near to one

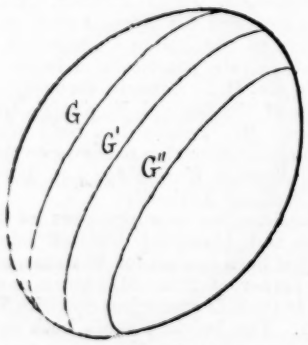


Fig. 87.

another, and get thereby the lines G, G^1, G^{11}, &c., we can look upon these lines as the different positions of a line G, which engenders the surface. We call that line the *Generator** of the surface. (See fig. 87.)

Principal Examples of the Generation of Surfaces.

Cylinders are generated by a straight line, G, bound to remain always parallel to a given line, K, and to touch another line, D, we shall call the *Director*. This is the definition of cylinders in general, what is commonly called a cylinder is only a special case in which the director is a circle, and the generator is perpendicular to the plane of the directing circle; such a cylinder is called a right cylinder. (See fig. 88.)

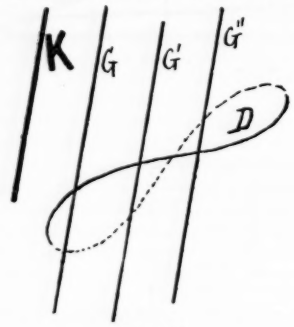


Fig. 88.

Cones are generated by a straight line, G, bound to pass through a point, *s*, named the *apex* of the cone, and to touch another line, D, called the director of the cone. Again, this is the definition of cones in general, of which the ordinary cone is but a special case, which is called a right cone. (See fig. 89.)

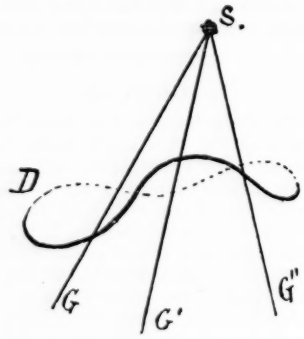


Fig. 89.

The directors of both cones and cylinders can be any line of their surface, but generally plane lines are selected, such as are formed by the section of the cone or the cylinder by a plane, and then the director is called the base of the cone or cylinder. We beg also to remark that cylinders are but cones where the apex, S, is situated at an infinite distance, and that we shall find, therefore, great similarity in the treatment of these two surfaces.

Surfaces of Revolution are engendered by a line, G, which revolves round an axis, A, to which it is bound. In this motion all the points of G describe circles; these circles are the sections of the surface of revolution by planes perpen-

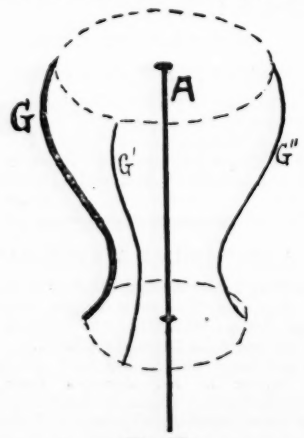


Fig. 90.

dicular to its axis. The generator can be any line of the surface, but generally a *meridian* is selected for the generator G, that is, the section of the surface by a plane passing through the axis A. (See fig. 90.)

Tangent Planes.

If through a point, *m*, of a curved surface we draw a series of curves, such as $m\ a$, $m\ b$, and G, the tangents to all these curves will be in the same plane; this is what we call the *plane tangent to the surface in m*.

In fig. 91 we have taken the points a and b on another generator G^1 of the surface; now, when the generating curve G^1 is taken infinitely near to the generator G, then the cords $m\ a$, $m\ b$, and $a\ b$ become the tangents to the curves $m\ a$, $m\ b$, and G; and, as the cords were contained in one plane, so are also the tangents. This remark is not restricted to any particular curves selected, but applies to any three curves whatsoever which cross one another in one point of the surface; therefore it holds good for all the curves, and we conclude that all the tangents to the surface in the point m are in one plane.

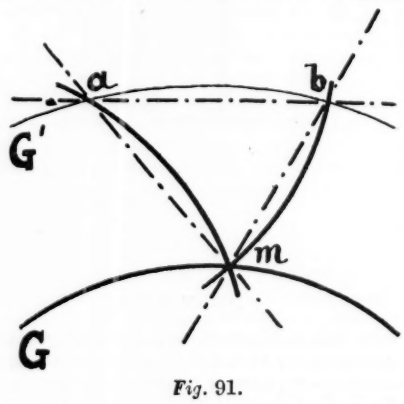


Fig. 91.

Planes tangent to cones and cylinders contain a generator of their surface, and are, therefore, tangent all along that line. In fig. 92 Sa and

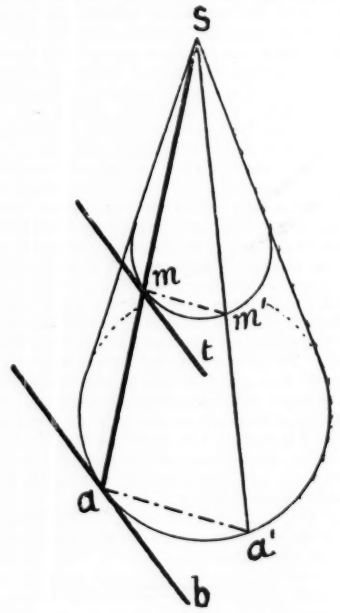


Fig. 92.

Sa^1 are two neighbouring generators of a cone; they are contained in one plane. When these generators are taken infinitely near to one another the plane which contains them becomes tangent to the cone, for the cords $m\ m^1$, $a\ a^1$ have become the tangents $m\ t$ and $a\ b$, and the generators have become united into one, namely, the generator Sa. We have said already above that the arguments applied to cones hold equally good for cylinders.

* The standard works on Geometry use the words "generatrix" and "directrix," because a line belongs, both in French and in Latin, to the feminine gender; but we see no obligation in the English language to follow this example, and as the plural "generatrices" and "directrices" is inconvenient and strange we prefer in this popular paper to use the masculine form of "generator" and "director."

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

350, Inlaying Wood. H. Forester.

The design is cut in the wood in the usual way, and is then filled in with a plastic composition, which afterwards hardens in place of the wood or ivory commonly employed.

3,691, Fireplace or Grate. W. Rooke.

The frame is cast with a chamber at the back, in which are arranged a series of gills to warm the air which passes through it, and which is carried away by pipes fitted into sockets cast on the top of the chamber to assist in warming other rooms. Fire-brick back and cheeks are fixed in recesses in the casting. A false grate is fixed in front of the frame by means of countersunk screws.

3,786, Fireproofing. L. M. Dulfus.

Relates to covering structures with an incombustible material, which is obtained by grinding 10 to 15 per cent. of fossil powder with 80 to 85 per cent. of neutral silicate of soda, having a density of 40° Beaumé, and decanting the mixture after two or three days, when the bases have been precipitated.

3,806, Artificial Stone. F. Wirth.

Unshrinkable cement with a surface that can be polished and applicable for lithographic stone, &c., is obtained by mixing unset cement with cement already hardened, or with finely-ground carbonate of lime. The mass is subjected to pressure, and water is added to it, and, finally, a solution obtained by the lixivation of cement is forced through the mass to fill up all the pores.

3,822, Straining Fence Wires or Ropes. J. Dick.

A sliding-head, worked by a screw, has a recess in which a wedge-shaped locking-piece, guided by a slot, is held. The wire to be strained is fixed between the locking-piece and the side of the recess. There is also a screw clamp to hold the wire tight while slack is being taken up.

3,957, Wood Screw, A. J. Boult.

The stem of the screw is made smaller in diameter than the screw thread beneath it, and is further made with a collar. These modifications are made in order to diminish the liability to split the wood.

1,539, Sector or Protractor. F. Wood.

A movable arm is attached to a fixed arm, at the other end of which a third arm is clamped at right angles. This latter arm is graduated so that any polygon can be described or any angle set off, and is grooved throughout its length to allow a set screw to pass through it to the movable arm. On this movable arm also slides a pencil-holder to strike circles of any desired radius.

907, Finger Plates for Doors. C. Clayton.

A dovetailed groove or recess tapering upwards is made on the back of the plate. A plate similar in shape to the recess is secured to the door by screws. The finger-plate is then slidden on to the projecting plate and is thus firmly held in position.

APPLICATIONS FOR LETTERS PATENT.

May 15.—5,993, A. Ford and J. Archer, Improved Material applicable as a Waterproof Covering for Roofs, &c.—6,001, W. Jameson, Improvements in Road Paving.—6,003, O. Imray, Rock Drills.

May 16.—6,009, W. Righton, Instantaneously Heating Water, &c.—6,012, R. Stoffert and T. Dykes, Construction of Girders.—6,025, W. Montgomery, Fire-resisting Cement.—6,027, J. Tulloch and T. Tulloch, Construction of Fireproof Buildings.—6,034, R. Hale, Ventilators, &c.

May 18.—6,077, G. Thynne, Sanitary and other Pipe Joints.

May 19.—6,093, W. Thompson, Improved Fire-escape Tower or Staircase.—6,115, M. Schneider, Fire Stoves or Grates.—6,121, J. Weston, Improvements in Door Springs.—6,133, E. Cammiss, Manufacture of Bricks.—6,146, H. Haddan, Workmen's Controlling Apparatus or Timekeeper.—6,149, D. McCowan, Manufacture of Enamel Paint.—6,157, C. Schlickeysen, Apparatus for Cutting Bricks and Tiles.

May 21.—6,212, W. Mitford and G. Pettigrew, Joint for Water, Steam, Gas, or Drain Pipes.—6,217, T. Heaps, Fixing Tiles together, and Fastening same to Hearths of Fire-grates and Floors.—6,225, E. Bellow, Latches for Doors, Gates, &c.—6,249, G. Redfern, Improvements in Tiles.—6,250, R. Barnes and S. Heath, Meters for Measuring Water, &c.—6,227, S. Mason, Concrete-mixing Machines.

PROVISIONAL SPECIFICATIONS ACCEPTED.

2,999, E. Newton, Improvements in Saw Frames.—4,629, J. Miller, Ventilators and Chimney Tops.—4,975, C. and F. Smith, Attaching Door-knobs to their Spindles.—5,189, A. Dake, Improvements in Concrete Lights.—5,203, C. Few, Improvements in Portable Houses.—5,377, A. Adams, Venetian Blinds.—5,418, H. Bean, Window-blind Roller—4,566, J. Barwick, Ceiling Ventilator.—4,663, B. Boothroy, Apparatus for Automatically Opening and Closing Ventilators.—4,813, J. Bower, Bedplates for Brick Moulds.—5,264, E. Clowes, Improvements in Hinges.—5,315, R. Perrott, Kitchen Ranges.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to opposition for two months.

10,295.—W. Pullen, Improvements in Stained-glass work.—10,442, B. Haigh, Apparatus for Disinfecting and Deodorising Closets and Urinals.—10,621, R. Worrall, an Improved Method of Constructing Brick Walls.—10,664, T. Purdie, Improvements in Water-closets.—10,667, W. Clark, Improved Method of Glazing.—10,687, J. Shanks, Improvements in Water-closets and Urinals.—10,759, J. Baker, Ventilating Apparatus.—11,718, R. Stanley, Improvements in Chimney-tops or Ventilators.—11,948, M. Williams, Manufacture of Mortar.—13,497, S. Chinn, Exhaust Ventilators.—13,915, P. Rees, Appliance for Protecting the Edges of Saws and other Tools when not in use.—4,759, W. Luther, Improvements in Sash-bars or Astragals.—4,830, R. Stoffert and T. Dykes, Improvements in Girders.—8,108, W. Hawkins, Construction of Buildings.—10,299, A. Rumley, Preventing the Return of Foul Air and Gases in Drain-pipes and Sewers, and ventilating the atmosphere therein.—11,054, J. Rickard, Fixing Corrugated Iron Roofing.—1,893, G. Hammond, Mitre-frame Cramp.—4,444, D. Menzies, Ventilator for Houses and other Buildings.—4,931, W. and E. Murdock, Improvements in Pavements.—4,943, F. Humpherson, Improved Joint for Pipes.—4,958, W. Lake, Decoration of Walls and Ceilings.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

MAY 18.

By H. BENINGFIELD.

Great Munden, Herts—"Brockhold's Farm," 304a. 1r. 5p., freehold £5,000

By PETTITT, SON, & BYRNE.

Pimlico—9, 10, and 17, West-street, 38 years, ground-rent 16*l.* 585
23 and 24, West-street, 38 years, ground-rent, 8*l.* 490

By C. G. CUTLER.

Spitalfields—75, Brick-lane, freehold 1,035

By WOOD & SPINK.

Croydon—"The Blacksmiths' Arms," and 2 and 3, South End, freehold 1,360
22 and 23, Upper Coombe, freehold 470

By BRITTAIN & SON.

Clerkenwell—18, Seckforde-street, 28 years, ground-rent 6*l.* 495
Kingsland—34, Buckland-street, 49 years, ground-rent 5*l.* 400
60, Southgate-road, 32 years, ground-rent 4*l.* 10*s.* 425

By C. DAVENPORT.

Lambeth—1, Philadelphia-terrace, 18 years, ground-rent 5*l.* 140
Southwark—6, London-road, 2 years, ground-rent, 19*l.* 16*s.* 60

By A. R. SAVAGE & SON.

Stepney—55 and 57, Belgrave-street, 5 years, ground-rent 12*l.* 4*s.* 65
Bromley—25, Ettrick-street, 88 years, ground-rent 5*l.* 180
St. George's-in-the-East—31 and 33, Martha-street, 7 years, ground-rent 23*l.* 55
Bethnal-green—99, Roman-road, 69 years, ground-rent 15*l.* 165
Dalston—55 and 57, Holly-street, 36 years, ground-rent 48*l.* 305
Bethnal-green—1, Winchester-street, 30 years, ground-rent 12*l.* 12*s.* 190
Kingsland—35, De Beauvoir-crescent, 44 years, ground-rent 4*l.* 10*s.* 300
Paddington,—15, Porteous-road, 54 years, ground-rent 7*l.* 515
Camberwell—92, Acorn-street, 49 years, ground-rent 1*l.* 10*s.* 525
Peckham—21, 23, and 25, Athearn-road, 80 years, ground-rent 11*l.* 5*s.* 450
Hackney—28 and 30, Frampton Park-road, 71 years, ground-rent 8*l.* 8*s.* 445

MAY 19.

By CHINNOCK, GALSWORTHY, & Co.

Wargrave, near—The residence called "The Willows," freehold 4,550

By BARKER & NEALE.

Stockwell-road—No. 103, freehold 1,990

By W. S. LYON.

South Kensington—139, Gloucester-road, 34 years, ground-rent 9*l.* 1,350

By C. E. FARNFIELD.

Shepherd's Bush—316 to 332 even, Uxbridge-road copyhold 3,400

By Mr. CRONINS.

Holloway—Improved ground-rents of 97*l.* 6*s.*, term 71 years 1,740

By J. READ.

Lower Kennington-lane—Improved rental, 57*l.* 10*s.* term 42 years 760
Upper Kennington-lane—68, freehold 615

By HART & BAYFIELD.

Ealing, 4, Sandringham-terrace, 79 years, ground-rent 8*l.* 1,340

By F. JOLLY & Co.

Stepney—195, Oxford-street, and 70 and 71A, Exmouth-street, 16 years, ground-rent, 4*l.* 295
West Ham, Park-road—A plot of freehold land 75
Cecil-road, two plots of freehold land 115
Mile End-road—No. 608, freehold 1,140
Whitechapel—6, Raven-street, and chapel at rear, 26 years, ground-rent 22*l.* 210

By Mr. GAIGER.

Bloomsbury—24, Leigh-street, 22 years, no ground-rent 190
St. Luke's—199, Lever-street, 6 years, no ground-rent 40
Kingsland—59, Pearson-street, 16 years, ground-rent, 2*l.* 10*s.* 175
66 to 72 even, Clarissa-street, 34 years, ground-rent 12*l.* 685
Islington—30 and 32, Arlington-street, 42 years, ground-rent 8*l.* 8*s.* 695
King's Cross-road—52, Margaret-street, 31 years, ground-rent 5*l.* 265
Camden-road—141, Hungerford-road, 76 years, ground-rent 5*l.* 5*s.* 400
Chalk Farm—6 and 7, Powlett's-place, 18 years, ground-rent 7*l.* 250

By H. FOSTER & Co.

Rotherhithe—52, 54, 56, 64, 66, and 68, Rotherhithe New-road, and 1, Luxford-street, 67 years, ground-rent 24*l.* 7*s.* 6*d.* 1,370
14, Queen-street, freehold 210

By DEBENHAM, TEWSON, & Co.

Brenchley, Kent—Freehold pleasure farm of 159 acres 4,500
Epping, near—"High Elms Farm," about 60 acres, freehold 2,540
South Kensington—5, Exhibition-road, freehold 2,150
Chelsea—317 to 325 odd, Fulham-road, 63 years, ground-rent 100*l.* 6,530

By W. H. MOORE.

Islington—37, Compton-road, 60 years, ground-rent, 7*l.* 12*s.* £540
Peckham—57 and 59, Bird-in-Bush-road, 82 years, ground-rent, 10*l.* 300
Kentish Town—53, Kelly-street, 50 years, ground-rent 8*l.* 480

By FAREBROTHER, ELLIS, CLARK, & Co.

Edgware-road—Nos. 223 and 225, freehold 5,220
2, Praed-street, freehold 4,000
4, 6, and 8, Praed-street, freehold 4,780
Aldershot, near—Three enclosures of freehold land 129a. 3r. 15p. 2,820
Great Marlow, near—A plot of land, 1a. 2r. 28p. ... 85

MAY 20.

By DRIVER & PEERFECT.

Caledonian-road—2 and 4, Bingfield-street, 55 years, ground-rent 2*l.* 2,845

By W. B. CRANFIELD.

Enfield—Ground-rent of 70*l.* a year, reversion in 37 years 1,450
An enclosure of freehold land, 2a. 2r. 7p. 710
Sewardstone—An enclosure of land, 1a. 2r. 0p., freehold 60

By FULLER, HORSEY, SONS, & CASSELL.

Gravesend—The Milton Ironworks, freehold, area 25,800 ft. 2,500

By J. BAKER & WILKINSON.

Kilburn—37 and 39, Brondesbury-villas, 73 years, ground-rent, 24*l.* 895
Sudbury, Elms-lane—A plot of freehold land 195
Mutton-lane—A plot of freehold land 150

By WALFORD & WILSHIN.

Anerley, Avenue-road—"Park House," 77 years, ground-rent, 9*l.* 7*s.* 6*d.* 1,000
"Eversleigh," 77 years, ground-rent, 15*l.* 1,050
A plot of land, 77 years, no ground-rent 970

By C. A. RICHARDS.

Hendon—14 and 15, Ravenstone-road, 98 years, ground-rent 9*l.* 260
Limehouse—1A, Rich-street, freehold 305
Chelsea—5 and 6, Cale-street, 4 years, no ground-rent 125
Ground-rent of 41*l.* 18*s.* a year, term 4½ years 170

By NORTON, TRIST, WATNEY, & Co.

Vauxhall—Freehold rental of 100*l.* a year, term 52 years 2,150
8 to 13 Glyn-street, freehold 2,590
Freehold ground-rents of 54*l.* a year, reversion in 80 years 1,170
Freehold ground-rents of 78*l.* a year, reversion in 77 years 1,893
Leicester-square—Freehold rental of 50*l.* a year, reversion in 20 years 1,150
Peckham Rye—Freehold rental of 60*l.* a year, reversion in 37 years 1,430
Stroud's Vale—A plot of freehold land 270
Kilburn—A plot of freehold land 75
An improved rental of 60*l.* a year, term 80 years 810
Paddington—An improved rental of 118*l.* a year, term 52 years, short reversion 1,780
Camden Town—An improved rental of 84*l.* 15*s.* a year, term 64 years, short reversion 1,250
Notting-hill—164, High-street, 81 years, ground-rent 40*l.* 1,515
Pimlico—2, Lupus-street, 52 years, ground-rent 1*l.* 290

MAY 21.

C. D. FIELD & SONS.

Southwark—15 to 29 odd, Red Cross-street, and eighteen cottages in Wood's-yard, freehold, area 26,000 ft. 9,075
Union-street, freehold land, area 13,000 ft. 2,300
Croydon—1 to 6, Thornton-road, freehold 600

By BALL, NORRIS, & HADLEY.

Lower Clapton—51, Median-road, 81 years, ground-rent, 6*l.* 10*s.* 300

By PRICKETT, VENABLES, & Co.

Euston-square—Melton-street, &c., improved ground-rents of 276*l.* 5*s.* a year, term 25 years ... 3,370
Improved ground-rent of 63*l.* 16*s.*, term 23 years 800

By NORTON, TRIST, WATNEY, & Co.

City—4, Westmoreland-buildings, freehold 4,300
Notting-hill—52 and 54, Ladbroke-grove, freehold ... 4,250
Tavistock-square—Nos. 30 and 31, term 38 years, ground-rent 40*l.* 2,720
Camberwell—Ground-rents of 9*l.* 9*s.* a year, reversion in 13 years 380
Ground-rents of 56*l.* a year, reversion in 81 years 1,210
Ground-rents of 19*l.* 19*s.* a year, reversion in 37 years 510
Ground-rents of 3*l.* 5*s.* a year, reversion in 33 years 80
Southwark—63 to 73 odd, Friar-street, and 32 and 33, Great Suffolk-street, freehold 2,240
Whitechapel—22 and 32, Ellen-street, 13 years, ground-rent 6*l.* 125

By E. STIMSON.

Southwark, Tooley-street—Five plots of freehold land 7,920
Dockhead—Two plots of freehold land, area 9,855 ft. 2,300

By NEWSON & HARDING.

New Wandsworth—17 and 18, Louvaine-road, 89 years, ground-rent 14*l.* 715
Clapton—93, Clarence-road, 77 years, ground-rent 6*l.* 3*s.* 635
Bethnal Green-road—6 to 24 even, Fuller-street, 25 years, ground-rent, 80*l.* 790
51 to 60, Edward-street, 25 years, ground-rent 70*l.* 820
1 to 6, Granby-terrace, 25 years, ground-rent 60*l.* 720
Kingsland—38 to 41, Lee-street, 34 years, ground-rent 12*l.* 830
12 to 18 even and 59 to 65 odd, Loanda-street, 34 years, ground-rent 24*l.* 1,240
63, Clarissa-street, and 60 Loanda-road, 34 years, no ground-rent 540
Stoke Newington—1 to 6, Bowling Green-place, freehold 1,405

By BEADEL & Co.

Shadwell—Freehold ground-rent of 10*l.* a year, reversion in 28 years 365
Freehold rent of 100*l.* a year, with reversion in 42 years 2,000
Freehold ground-rent of 4*l.* a year, reversion in 52 years 100

MAY 22.

By W. B. HALLETT.

Holloway—7, Stock Orchard-crescent, 57 years, ground-rent 8*l.* 420
Islington—1, River-street, 32 years, ground-rent, 5*l.* 5*s.* 300

By WINSTANLEY, HORWOOD, & Co.

Limehouse—27 and 28, Dixon-street, 9¼ years, ground-rent 11*l.* £463

By DEBENHAM, TEWSON, & Co.

Denmark Hill, Love-walk—The residence, "Cornwall House," 63 years, ground-rent 10*l.* 1,000

By PHILLIPS, LEA, & DAVIES.

Finsbury—23, Wilson-street, 71 years, ground-rent 42*l.* 1,150

New Southgate—9, Holmesdale-road, 93 years, ground-rent 5*l.* 130

By EDWIN SMITH & Co.

Belsize Park—27, Buckland-crescent, 66 years, ground-rent 15*l.* 1,500

By BAKER & SONS.

Brentwood, near—"Bannister Farm," 31a. 2r. 26p. freehold 850

Malden—1, 2, 4, 10, and 11, Derby-villas, 79 years, ground-rent 24*l.* 10s. 1,080

By E. HOLSWORTH.

Homerton—10 and 21, Marian-street, freehold 275

Dalston—58 and 60, Malvern-road, 60 years, ground-rent, 10*l.* 750

8, Ritson-road, 67 years, ground-rent 5*l.* 335

Hackney—260, Richmond-road, 59 years, ground-rent 7*l.* 440

6, Anton-street, 81 years, ground-rent 6*l.* 10s. 335

Stoke Newington—1, Derwent-terrace; and 60, Brook-road, 88 years, ground-rent, 7*l.* 400

MEETINGS.

SATURDAY, MAY 30.

Architectural Association.—Visit to Buchan Hill Mansion, Crawley, Sussex (Messrs. Ernest George & Peto, architects). Train from Victoria, 1.30 p.m.

Civil and Mechanical Engineers' Society.—Visit to the new Blackfriars Railway Bridge. 2.30 p.m.

Edinburgh Architectural Association.—Annual excursion: to Inchcolm, Donibristle, Dalgety, and Aberdour.

MONDAY, JUNE 1.

Surveyors' Institution.—Annual General Meeting, 3 p.m. Followed by Annual Dinner (at Holborn Restaurant). 6.30 p.m.

Society of Engineers.—Mr. Henry Faija on "Portland Cement." 7.30 p.m.

Clerks of Works' Association.—Mr. G. R. Webster on "A Simple Method of Perspective Drawing" (second paper). 8 p.m.

Inventors' Institute.—8 p.m.

Royal Institute of the Architects of Ireland (Dublin).—Council meeting.

Edinburgh Architectural Association.—Annual General Meeting. 8.30 p.m.

TUESDAY, JUNE 2.

Institution of Civil Engineers.—Annual General Meeting (under Revised By-Laws) to receive the Report of the Council, and to Elect the Council for the Ensuing Year. 8 p.m.

Society of Biblical Archæology.—(1) The Rev. H. G. Tomkins "On the Topography of Northern Syria, with Special Reference to the Karnak Lists of Thothmes III." (2) Mr. Theo. G. Pinches "On Specimens of the Familiar Correspondence of the Babylonians and Assyrians." (3) Professor A. H. Sayce on "The Site of This." 8 p.m.

Birmingham Architectural Association.—Ordinary Meeting: Nomination of Officers. 7.30 p.m.

WEDNESDAY, JUNE 3.

Builders' Foremen and Clerks of Works Institution.—Ordinary Meeting. 8.30 p.m.

THURSDAY, JUNE 4.

Society of Antiquaries.—Ballot for Election of Fellows. 8.30 p.m.

Royal Archæological Institute.—(1) Mr. F. C. J. Spurrell on "Some Early Sites and Works on the Margin of the Thames (tidal portion)." (2) Mr. John E. Price F.S.A., "Comparative Notes on Roman Remains at Hitchin and Alresford." (3) Mr. R. S. Ferguson, F.S.A., on "Elizabethan Standard Weights and the Carlisle Bushel."

FRIDAY, JUNE 5.

Institution of Civil Engineers.—The President's *Conversazione* at the Inventions Exhibition. 9 to 12 p.m.

Miscellanea.

Society of Arts.—The results of the Society of Arts' examinations have just been published. There was a satisfactory increase in the number of candidates, 1,208 having presented themselves at 44 centres, whereas last year there were 991 candidates and 38 centres. Of these 1,208 candidates 953 passed and 255 failed. The number of papers worked was 1,321; of these 145 took first-class certificates, 410 second class, and 474 third class, while to 292 papers no certificate was awarded. Eleven of the thirteen subjects set down for examination were taken up. In two no examination was held, as the requisite number of candidates (25) did not present themselves. The largest number of papers worked (336) was in book-keeping. Other favourite subjects were:—Arithmetic, 171; English (including composition and correspondence and précis writing), 118; shorthand, 253; theory of music, 243. In French there were 96 candidates; in German only 28.

Great Eastern Railway: Essex Lines.—The construction of the railway, about nine miles in length, from Shenfield, near Brentwood, to Wickford, authorised by the Great Eastern Railway General Powers Act, 1883, is about to be commenced. The contract, which includes the erection of stations at Shenfield Junction, Billericay, and Wickford, has been let to Mr. T. D. Ridley, of Harwich and Middlesbrough.

Domestic Electric Lighting.—The *Electrical Review* of the 16th inst. gives a detailed account of an electric lighting installation lately set up at Westwood House, Sydenham, the residence of Mr. Henry Littleton, the principal of the well-known music publishing firm of Novello, Ewer, & Co., which has recently been rebuilt from designs by Mr. J. L. Pearson, R.A. This rebuilding has been carried out by Messrs. Veitch & Close. Westwood House and two smaller houses, occupied respectively by Messrs. Augustus and Alfred Littleton, stand in grounds of about nine acres in extent, and towards the latter end of last year Mr. Littleton finally decided to adopt the electric light, placing the arrangements for illumination entirely in the hands of his son, Mr. A. Littleton. The prime mover is one of the "Otto" 8 horse-power (nominal) gas engines, running a few hours a day for charging accumulators. The dynamo is a shunt-wound "Phœnix," of Paterson & Cooper's manufacture, giving at its normal speed 110 volts and about 50 ampères. The accumulator-room is a spare loose horse-box, well suited for the purpose. Here are placed 100 glass cells, 1½ horse-power type of the Electrical Power Storage Company's secondary batteries, with the latest improvements, and coupled up in twos. The lamps used are made by Messrs. Woodhouse & Rawson, and are chiefly of 20-candle power. The operations of fixing the lamps, wiring the houses, laying the main cables, and generally carrying out the work connected with the installation, was undertaken by Messrs. Paterson & Cooper, and this has been completed to the entire satisfaction of Mr. Littleton. The various switches, fusible plugs, and measuring instruments, are from the same firm, but Messrs. Faraday & Son have supplied all the fittings for Mr. Augustus Littleton's rooms, and Messrs. Barkentin & Krall, of Regent-street, have designed very original and unique fittings in hammered copper and iron for Westwood House. The two small houses are lighted throughout with about seventy lamps each, and Westwood House will contain more than double that number, and including those for a small theatre, the total will be nearly 400 lights. The whole installation will be in charge of a youth of about eighteen years of age, who will, however, spend but half his time in this work. It is stated that since the beginning of January, when a portion of the lamps were first put into use, no hitch of any kind has occurred.

A Proposed Art-Museum for Bath.—A case before Mr. Justice Chitty in the Chancery Division last week raised questions as to the validity of bequests contained in a codicil of the late Miss Holburne, of Bath, executed three days before death, whereby she gave the collection of the late Sir Thomas William Holburne, consisting of antique plate, china, &c., to certain persons for their own use absolutely, and also a sum of 10,000*l.* and her residuary estate to the same persons. She also gave the house to them in which she lived. These persons admitted that the testatrix in making the gifts intended that they should act as trustees and form an art-collection for Bath, and that the 10,000*l.* and residuary bequest was intended for the maintenance and protection of this collection. They produced correspondence to that effect, showing such intention on the part of the testatrix, and also that she had during her lifetime contemplated buying Sydney House, Bath, for the purposes of a "Holburne Museum," and endowing it with 10,000*l.*, but the negotiations fell through. The questions were whether the gifts in the codicil fell within the prohibitions of the Statute of Mortmain, precluding testamentary dispositions of land or houses, or money to be laid out in land or houses, or of money to support or endow houses or land. Mr. Justice Chitty said that the first question was whether the gifts were charitable gifts within the legal meaning of the term. A public purpose of general utility, to the exclusion of private business, was obviously intended by the testatrix, as was shown by the correspondence. It was intended that the museum should be in Bath, and for that city, and kept there. The question then arose whether the gifts necessarily implied the purchase of a house. His lordship thought not, for the testatrix seemed to have successfully avoided using any language which would justify any such conclusion. It would be no breach of trust for the trustees to hire a room in which to have the collection in proper and careful custody.

Overhead Wires.—Notwithstanding the recommendations contained in the report of the Select Committee on Telephone and Telegraph Wires, which has just been issued, that the erection of overhead wires should be continued subject to proper regulation and supervision, care should be taken that the rights of the public are not encroached upon. The Committee propose to authorise the Postmaster-General to give notice of intention to erect telegraph lines before obtaining the consent of the road authority, such notice being publicly posted. All persons objecting are to send in the objections within a stated period. Such objections should be referred to a competent tribunal, empowered to authorise the erection of the line on just conditions, and to make orders as to the costs occasioned by the objections. This tribunal may be the county court judge, with an appeal to the Railway Commissioners, as at present, within a limited time. Provisions of existing Acts inconsistent with these suggestions are to be repealed, especially the provision requiring the Postmaster-General to obtain the consent of every occupier within 30 ft. of the pole. It will be seen from the above *résumé* that far too much and additional power is proposed to be placed in the hands of the Post Office, as against the public. Private rights cannot be too jealously guarded, whether against monopolies or the State. Persons who have had experience in resisting those two powers are only too well aware how difficult and how expensive it is to act by legal means against them.—*Iron.*

Wings.—It may be taken for granted that the introduction of wings into ornamental design was due directly to their symbolic meaning. What more suggestive of the heaven above, and all that pertains to it, than wings? Once, however, admitted, they soon assumed a very important place in virtue of their absolutely ornamental character,—and held it. Accordingly we find that in the ornament of all periods great decorative use is made of the wing, from the winged globe of early Egyptian art, symbol of eternity, to the winged love of modern French design, symbol only of frivolity. And yet, for all the ornamental character of the wing, there has always been a difficulty in satisfactorily combining it with animal forms in which nature had not made structural provision for it. The happy thought, at whatever early period it occurred to man, was one of those inspirations more poetic in its conception than easy to realise in plastic form. The realisation is almost inevitably a degradation of the idea. This is less the case in the earlier and more archaic art, which touches us by its naïveté, whereas in work of later date we should see rather the comicality of it. What was possible to the artist of the old world is not possible to us. We may not attempt what came naturally to him to do, because to us it is not natural.—*Art Journal.*

Sanitary Supervision of Hotels.—The Sanitary Protective League of New York city has originated an entirely new sanitary movement. It has prepared a Bill, which it will try and get passed by the State Legislature, which provides that in all towns and cities in which there are Boards of Health, the owners or keepers of all hotels and lodging-houses shall apply to such Boards for sanitary certificates, which shall certify to the good sanitary condition of their houses. These certificates shall not be granted to houses which have not freedom from dampness of site or cellar, proper drainage and plumbing, absence of foul and noxious odours, adequate supply of water, direct light in sleeping-rooms, and at least 600 cubic feet of air-space for each occupant. Each innkeeper must obtain and display this certificate, as failing to do so subjects him to damages for sickness of occupants during such negligence, and, in case of death, the executors of the deceased have cause for action.—*Sanitary Record.*

Lostwithiel.—A site which has been vacant for some years, adjoining the United Methodist Free Church on the Bank, is about to be utilised for the erection thereon of a minister's house, with a shop and premises at the angle of the site to Queen-street and Bodmin-hill, a sufficient space being allowed at the north end for any extension hereafter of their church as may be found expedient. The plans have been prepared by Mr. A. E. Skentlebury, architect, of Lostwithiel. The cost will be about 700*l.*, and the contractor is Mr. J. Reed, of the Kirkby Building Yard, Plymouth.

The Mersey Docks and Harbour Board.—At the usual meeting of this Board, held on the 21st inst., Mr. Littledale directed attention to the purchase by the Works Committee of hydraulic machinery for a swing bridge, and asked for the reasons why this change had been decided upon. He complained that the bridge forming the connexion between the east and west sides of dock "K" at its northern end had not been long since ordered. He also inquired whether the swing bridge was in substitution of some other kind of bridge, and what would be the cost of the alterations in the quay walls to receive the bridge. He concluded by moving that the recommendations of the committee of works stand over for a week in order that the whole question might be inquired into. Mr. Lyster, the engineer, entered into a brief explanation, but Mr. Littledale contended that none of his questions had been answered. As, however, there was no seconder to Mr. Littledale's motion, it fell to the ground, and the minutes were confirmed. Mr. Littledale subsequently directed attention to the report of the engineer on the deflection of the west wall of the Brocklebank Dock and moved that the report made at the time of the bursting of a water-pipe, referred to by the engineer, be laid before the Board, and also that the works committee be requested to report the time at which the said bursting of the pipe occurred, and at what time the pressure of water was shut off. He contended that neither the bursting nor the leakage of a water-pipe could, in the course of a very short time, cause a deflection in the wall to the extent of 430 ft. in length. The deflection arose from the weakness of the construction of the wall, and he therefore asked for the production of the report in order to test the accuracy or the inaccuracy of his statements. The Chairman explained that originally the report was only a verbal one, and its accuracy had since been fully confirmed by Mr. Lyster. If, however, it was wished to carry the discussion further, it would be necessary that the motion should be seconded. Mr. Littledale finding no seconder, his motion fell to the ground; and he remarked that "there is a day of reckoning coming for all that."—*Liverpool Journal of Commerce.*

A Memorial Brass, by Mr. James Forsyth, has just been placed in Prestwich Church containing the following inscription:—"In loving memory of Henry Mildred Birch, B.D., formerly Fellow of King's College, Cambridge, and Assistant Master of Eton College. For thirty-two years Rector of this Parish, Canon Residentiary of Ripon Cathedral, Chaplain in Ordinary to the Queen, also Chaplain and sometime Tutor to His Royal Highness Albert Edward Prince of Wales. Born January 12th, 1820; died June 29th, 1884."

British Archæological Association.—At the meeting on Wednesday, May 20th (the Rev. Dr. Sparrow Simpson in the chair), it was announced that the annual congress would be held early in August, at Brighton, for the purpose of paying visits to many places of interest in West Sussex. Among these will be Arundel Castle, by permission of his Grace the Duke of Norfolk; the Roman pavements at Bignor, Chichester Cathedral, Steyning, Shoreham, and Sompting Churches, and many others.

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITIONS.

Nature of Work.	By whom required.	Premium.	Designs to be delivered.	Page.
Erection of Schools	Northfleet School Brd.	15*l.* 15s.	June 23rd	i.
New Schools	Bristol School Board	2nd and 3rd, 20 to 15 gs.	July 20th	ii.
Dwellings for Labouring Classes	Liverpool Corporation	50*l.* and 25*l.*	August 1st	ii.
Marine Piers	Bournemouth Com.	100 gs., 50 gs., & 25 gs.	August 19th	i.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Formation of Footpaths, &c.	Met. Board of Works	*Official*	June 2nd	ii.
Painting Barracks	War Department	do.	do.	ii.
Wrought-Iron Fencing, &c.	Southend Local Board	A. Cayton	do.	xix.
Kerbing and Channelling	Lewisham Brd. of Wks.	*Official*	do.	xix.
Tower Clock	Leeds Union	do.	do.	xix.
Cleaning and Painting	Midland Railway Co.	A. A. Langley	June 5th	ii.
Repairs, Painting, &c.	Met. Asylums Board	M. Wyatt	do.	ii.
Laundries, Staff Accommodation, &c.	do.	H. Jarvis & Son	June 6th	ii.
Fittings to Telegraph Office, Gloucester Docks	Com. of H.M. Works	*Official*	June 8th	ii.
Painting and General Repairs, Herne Bay	Sth. Metro. Sch. Dist.	do.	do.	xix.
Painting, Whitewashing, &c.	St. George's Union	H. S. Snell	June 9th	ii.
Repairs to Baths and Laundry	Com. for Pub. Baths, &c. St. James's, Wstmnstr	*Official*	June 10th	xviii.
Alterations and Additions to Malt Houses	P. Phipps & Co., Lim.	H. Stopes & Co.	do.	xix.
Fog Bells and Machinery to Lighthouses	Dublin Port & Dcks Bd.	B. B. Stoney	do.	xix.
Erection of a Building	Church Congress Missn	G. Rake	do.	ii.
Sewering, Kerbing, &c.	Southgate Local Board	C. G. Lawson	June 11th	ii.
Addition to Urinal, Lothbury	Commissionrs of Sewers	*Official*	June 12th	ii.
New Passenger Station, Bishop Auckland	North Eastern Railway	W. Bell	June 17th	ii.
Erection of Drill Shed, &c.	Admiralty	*Official*	June 19th	ii.
New Schools and Buildings	Hampton Wick Sch. Bd.	R. T. Elsam	June 20th	ii.
Furniture and Fittings	London School Board	*Official*	June 22nd	ii.
Six Girls' Houses, &c., at Schools	Grdns. Bethnal Green	A. & C. Harston	June 23rd	ii.
Erection of a Theatre, Bilbao	Board of Directors	.....	June 26th	ii.
Cleansing and Watering	Bristol U. S. A.	*Official*	July 1st	xviii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Junior Assistant	Boro. Surveyor, Oldham	100*l.*	Not stated	xvi.

TENDERS.

For new offices, at the corner of Blomfield-street, London-wall, for Messrs. Waterlow & Sons, Limited. Messrs. Davis & Emanuel, architects, 2, Finsbury-circus. Quantities by Mr. Frederick Downing, 7A, Whitehall-yard:—

Lovatt, Wolverhampton	£27,070	0	0
W. Cubitt & Co.	26,840	0	0
Colls & Sons	26,777	0	0
E. Conder	26,469	0	0
George Shaw	27,500	0	0
Macey & Sons	25,695	0	0
Holland & Hannen	25,656	0	0
G. S. S. Williams & Son	25,590	0	0
John Woodward	25,440	0	0
John Grover & Son	24,418	0	0
S. J. Jerrard	23,979	0	0
E. Lawrance & Son	23,975	0	0
Ashby & Horner	23,790	0	0
Geo. Trollope & Sons	23,630	0	0
Lucas Bros. (too late)	23,600	0	0
J. Mowlem & Co. (accepted)	23,550	0	0

For the enlargement of the Girls' Industrial Home, Ipswich. Mr. E. T. Bisshopp, architect and diocesan surveyor:—

T. Thwaites	£3,330	0	0
J. & A. Brown	3,050	0	0
F. Dupont	2,850	0	0
R. Girling	2,742	0	0
R. S. Smith	2,650	0	0
Geo. Kenney	2,494	0	0
O. Gibbons	2,450	0	0

For the erection of eight shops and dwelling-houses, in the King's-cross-road. Mr. M. S. Reilly, architect. Quantities by Mr. Mark W. King:—

G. Masters & Sons, Anerley	£7,547	0	0
Killby & Gayford, London	6,234	0	0
E. Conder, London	6,068	0	0
J. & J. Greenwood, London	5,931	0	0
Riley Bros., London	5,750	0	0
C. Blyton, London	5,600	0	0
J. & H. Cocks, London	5,597	0	0
E. Burch & Co., London	5,531	0	0
H. R. Ockenden, London (accepted)	4,991	0	0

For the erection of new additions to St. Giles's and St. George's Workhouse, Bloomsbury, for the Guardians of the Poor. Messrs. William & A. Beresford Pite, architects. Quantities by Messrs. Gardiner, Son, & Theobald:—

Dove Bros.	£11,975	0	0
G. Stephenson	11,837	0	0
W. Titmas	11,750	0	0
J. W. Falkner	11,543	0	0
E. Conder	11,393	0	0
J. Mowlem & Co.	11,209	0	0
Colls & Son	10,940	0	0
Perry & Co.	10,938	0	0
G. H. & A. Bywater	10,888	0	0
Holland & Hannen	10,888	0	0
Higgs & Hill	10,884	0	0
W. Downs	10,873	0	0
J. T. Chappell	10,868	0	0
Edmund Toms	10,819	0	0
Peto Bros.	10,786	0	0
J. Grover	10,755	0	0
Patman & Fotheringham	10,752	0	0
Mark Patrick & Sons	10,717	0	0
W. Brass & Son	10,655	0	0
J. Smith & Sons	10,493	0	0
J. Simpson & Sons	10,360	0	0
J. B. Axford	10,295	0	0
Lathey Bros.	10,200	0	0
B. E. Nightingale	10,143	0	0

For the erection of new infant school buildings at Llanelly, South Wales, for the Llanelly School Board. Mr. E. H. Lingen Barker, architect, Hereford:—

D. Davies, Llanelly	£2,028	0	0
J. Evans, Llanelly	1,533	0	0
G. Mercer, Llanelly	1,399	5	0
D. C. Jones & Co., Gloucester	1,395	0	0
T. & J. Brown, Llanelly	1,378	0	0
D. Phillips, Llanelly	1,360	17	0
C. Edwards, Leominster	1,355	0	0
Thomas, Watkins, & Jenkins, Swansea (accepted)	1,300	0	0

For the erection of the Havelock Arms public-house, Gray's Inn-road, Holborn, for Mr. James Bacon. Mr. C. Young, architect, Strood Hill, Rochester. Quantities by Mr. J. B. Wall, 1, Walbrook:—

S. Salt	£3,945	0	0
T. Gregory	3,597	0	0
Jackson & Todd	3,378	0	0
H. L. Holloway	3,337	0	0
G. Gates	3,335	0	0
Lathey Bros.	3,319	0	0
Mattock Bros.	2,288	0	0
J. Higgs	3,093	0	0

For rebuilding offices, No. 5, Union-court, Old Broad-street, E.C. Mr. Alfred Conder, architect, Palace-chambers, Westminster. Quantities supplied by Mr. Harold O. Jackson:—

Brown, Son, & Bloomfield	£2,025	0	0
Kirk & Randall	1,887	0	0
W. Brass & Son	1,783	0	0
Lawrance & Sons	1,741	0	0
Mark Manley	1,737	0	0
W. Tongue	1,734	0	0
S. J. Jerrard	1,733	0	0
J. Grover	1,715	0	0
J. Morter	1,693	0	0
J. Woodward	1,690	0	0
G. S. Williams & Son (accepted)	1,677	0	0

[The amounts given are net, after allowing for old materials.]

For alterations and additions to No. 14, Bruton-street, Berkeley-square, for Capt. Steward. Mr. R. Fabian Russell, architect, Mount-street, W.:—

Woodward	£1,246	0	0

For the erection of detached house, Belsize-lane, Hampstead, for Mr. J. Metcalfe. Mr. R. Fabian Russell, architect:—

W. Smith	£1,150	0	0

Accepted for alterations and additions to the Tower of the Winds, Chilworth, near Southampton, for Mr. C. Simpson. Mr. W. H. Mitchell, architect, Southampton:—

Brinton & Bone	£2,760	0	0

For alterations to Tidey's Stables, Belsize-lane, Hampstead, for the London Parcels Delivery Company, Limited. Mr. W. Seckham Witherington, architect, 79, Mark-lane:—

R. Priestley	£875	0	0
F. Mark	809	0	0
Maxwell Bros.	779	0	0
Larke & Son	760	0	0
C. F. Kearley	747	0	0
T. Elkington (accepted)	735	0	0

For the erection of a cleft oak fence, Broad-lane, Tottenham, for the Tottenham Local Board:—

Edwards, Braughing, Herts	£320	0	0
Humphrey & Son, Tottenham	265	0	0
Taylor & Brooking, Dorking	265	0	0
J. Bloomfield, Tottenham	247	0	0
G. L. Wilson & Co., Tottenham	226	16	0
J. Pocock, Wood-green	220	0	0
Osborne, Stevens, & Co., South Wharf, Paddington (accepted)	209	9	9

Accepted for the erection of a caretaker's residence at the Torquay Local Board's new storage reservoir at Kennick, near Tottiford:—

Pack Bros., Torquay	£378	0	0

For extension and completion of outfall sewer, construction of tank, tool-shed, groyne, &c., at the Royal National Hospital for Consumption, Ventnor, for the Board of Management:—

J. Ball	£2,160	0	0
Ingram & Sons	1,998	10	0
J. Joliffe	1,800	0	0
G. Hayles (accepted)	1,412	7	0

Accepted for additions and alterations at Church Grange, Leek, for Capt. Colvile. Messrs. W. Sugden & Son, architects:—

W. Collis, Longton	£491	10	0

For works and fittings required for the Shaldon Water Supply, for the Teignmouth Local Board. Mr. George Crow, Surveyor to the Board:—

Building Well, Reservoir, and Machinery.

W. Hill & Co., London	£2,650 0 0	Burdon, Teignmouth*	£2,004 18 9
Hawkin & Best, Teignmouth	2,272 0 0	Bugbird, London	1,900 0 0
Landers, Southampton	2,168 0 0		

Fittings.

	5-inch Main per yd.	4-inch Main per yd.	3-inch Main per yd.	Hydrants at per each.	6-inch Cocks each.	5-inch Cocks each.	4-inch Cocks each.	3-inch Cocks each.
	s. d.	s. d.	s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
W. Hill & Co., London	5 0	4 6	3 6	5 5 0	7 0 0	6 10 0	6 0 0	5 5 0
Hawkin & Best, Teignmouth	4 7	3 6	2 9	2 10 0	3 17 6	3 4 0	3 0 0	2 10 0
Landers, Southampton	4 7	3 7	2 9	2 10 6	4 19 6	4 2 0	3 7 6	2 17 0
Burdon, Teignmouth*	4 2	3 2	2 5	2 2 6	3 15 0	3 16 0	3 3 0	2 15 0
Bugbird, London	4 4	3 4	2 4	3 0 0	4 0 0	3 15 0	3 4 0	2 13 0

* Accepted.

For alterations and repairs to the Oxford and Cambridge Stores, No. 2, New Oxford-street, for Mr. James Martin. Mr. Arthur W. Saville & Mr. W. J. Martin, joint architects, 99, Strand. Quantities supplied:—

Builder's Work.

Hollamby & Hobbs	£602 15 0
Lamble	595 0 0
Anley	579 0 0
Walker	537 0 0
Spencer & Co.	515 0 0
Cook	471 0 0
Ward & Lamble	464 0 0
Royal (accepted)	412 0 0

Pewterer's Work.

Heath	96 10 0
Saunders & Sons	96 0 0
Helling	90 17 0
H. Warne	89 10 0
Watts & Co.	84 17 0

Gasfitter's Work.

Winn	71 15 6
Pragnell (accepted)	53 0 0

For the erection of building at the waterworks, Wellingborough, for the Wellingborough Local Board of Health. Mr. E. Sharman, surveyor:—

J. Slinn	£853 0 0
E. Brown	689 0 0
Clayson Bros.	671 0 0
M. Harrison	663 0 0
T. Berrill	624 0 0
G. Henson	610 0 0
R. Marriott	597 0 0
J. Underwood	590 0 0

For finishing two houses and shops, with stabling on land behind, in the High-road, Kilburn, for Messrs. Broad & Co. Messrs. New & Son, surveyors:—

Pryor, Kilburn	£858 0 0
Scrivener & Co.	731 0 0
Tennant, Willesden	688 0 0
Longmire & Co.	656 0 0
F. Mark	655 0 0
Thomas & Butland	632 0 0
J. Allen & Sons, Kilburn	485 0 0

Accepted for making alterations at the Union Offices, Tetley House, Wakefield, for the Wakefield Guardians. Mr. William Watson, architect:—

George Fawcett (excavating, brick and stone work), A. M. Craven (carpenter and joiner's work), John Brooke (plumbing, glazing, ironwork, &c.), Thomas Naylor (painting)	£204 16 6

[Thirty-five tenders received.]

Accepted for painting, &c., inside and out, the Clayton Hospital buildings, Wakefield, Mr. William Watson, architect:—

Charles Turner & Sons	£152 17 6

Accepted for rebuilding a block of houses and shops in Kirkgate, Wakefield, for Mr. J. O. Strafford. Mr. William Watson, architect, Wakefield:—

Samuel Storr (excavating, brick and stone work), C. F. Rycroft (slater's work), J. C. Tattersall (plasterer's work), John Lloyd (carpenter and joiner), S. Atkinson (plumbing, glazing, ironwork, &c.), Charles Turner & Sons (painting)	£1,781 5 0

[Seventy Tenders received.]

Accepted for fittings for the gymnasium at the Blind Asylum, Manchester. Mr. C. Heathcote, architect:—

J. Wilson, jun., Hulme, Manchester	£150 0 0

For the erection of new Mission Chapel, Hackney Wick. Mr. J. Weir, architect:—

Jarvis & Sons	£1,531 0 0
Skiller & Sons	1,462 0 0
Rider & Sons	1,414 0 0
W. Shurmur	1,395 0 0
Lathey Bros.	1,394 0 0
J. D. Hobson	1,335 0 0
J. Holloway	1,300 0 0

[We are informed that the list of tenders for this work which we published last week was incorrect and incomplete, and that the foregoing is a correct list.]

SPECIAL NOTICE.—Lists of Tenders frequently reach us too late for insertion. They should be delivered at our Office, 46, Catherine-street, W.C., *not later than Four p.m.* on THURSDAYS.

TO CORRESPONDENTS.

G. A. L.—W. P.—T. C. S. (not lost sight of it, but we have more things than we know how to get in).—E. F. A. Allard, Brussels.—H. H.—"An Unsophisticated One" (should send name and address; we cannot print an unauthenticated letter).—R. & D.—G. H. (shall be attended to).—O. S.—"Abacus" (we will attend to the suggestion; it is not necessary to print the letter. N.B.—Correspondents should *always* send name and address, whether for publication or not).

All statements of facts lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

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PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, Covent-garden, W.C. to

DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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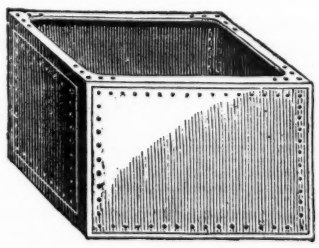

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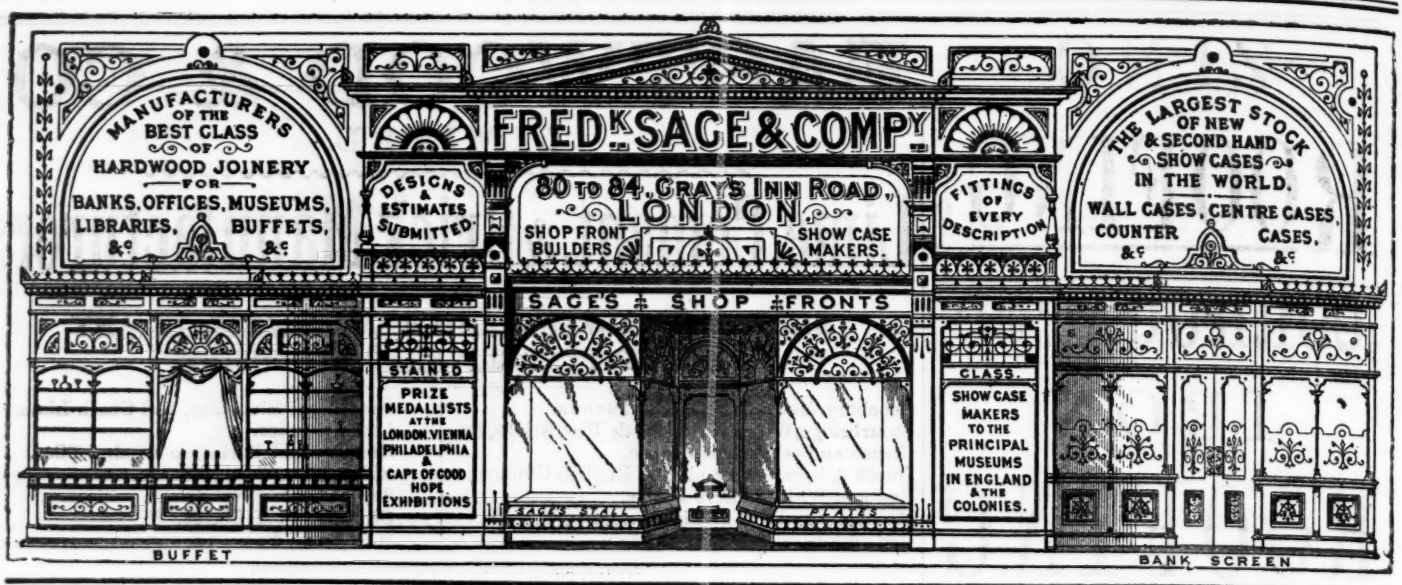
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A copy of the Specification as proposed to be amended can be inspected at the Patent Office, and full particulars of the proposed amendment were published in the Official Journal of the Patent Office, issued on the 22nd day of May, 1885, No. 145, page 1,340.
Any person or persons intending to oppose the said Application must leave particulars in writing of his or their objections to the proposed amendment at the Patent Office, 25, Southampton Buildings, Chancery-lane, London, W.C. within one calendar month from the date hereof.
Dated this 22nd day of May, 1885.
(Signed) H. READER LACK, Comptroller-General.
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PURSUANT to an Order of the High Court of Justice, Chancery Division, made in the matter of the ESTATE of WILLIAM HYDE, deceased, and in an action Charles Bird (trading as Charles Bird & Co.), on behalf of himself and all other the CREDITORS of the said William Hyde, deceased, against George Whitaker and Ellen Hyde (widow), 1885, H. 1,734.
The CREDITORS of WILLIAM HYDE, late of Church End, Willesden, in the County of Middlesex, Builder and Contractor, who died on or about the 7th day of February, 1885, are on or before the 22nd day of JUNE, 1885, to send by post, prepaid, to Mr. ARTHUR WELLESLEY PECKHAM, of the firm of Messrs. Valpy, Chaplin, & Peckham, of 19, Lincoln's Inn-fields, in the said County of Middlesex, Solicitors for the Defendants, George Whitaker and Ellen Hyde, who are the Executor and Executrix respectively of the deceased, their Christian and Surnames in full (including those of Partners), their Addresses and Descriptions, the Full Particulars of their Claims, a Statement of their Accounts, and the nature of the Securities (if any) held by them, or in default thereof they will be peremptorily excluded from the benefit of the said Order.
Every Creditor holding any security is to produce the same before the Vice-Chancellor, Sir JAMES BACON, at his Chambers, Royal Courts of Justice, Strand, on the 1st day of JULY, 1885, at TWELVE of the clock at Noon, being the time appointed for adjudicating on the Claims.
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